

Effectiveness of the Basic Antenatal Care Package in Primary Health Care Clinics.

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**This study is dedicated to those women who lived through
a pregnancy with the hope of holding a baby in her arms
but returned home with empty arms and an ache in her
heart which she carries forever.**

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Abstract

Pregnancy challenges the health care system in a unique way in that it involves at least two individuals – the woman and the fetus. The death rates of both pregnant women (maternal mortality) and newborns (perinatal mortality) are often used to indicate the quality of care the health system is providing. In terms of maternal and perinatal outcomes South Africa scores poorly compared to other upper-middle income countries (Penn-Kekana & Blaauw, 2002:14). The high stillbirth rate compared to the neonatal death rate reflects poor quality of antenatal care. Maternal and perinatal mortality is recognised as a problem and as a priority for action in the Millennium Development Goals (Thieren & Beusenbergh, 2005:11). The Saving Mothers (Pattinson, 2002: 37-135) and Saving Babies (Pattinson, 2004:4-35) reports describe the causes and avoidable factors of these deaths with recommendations on how to improve care. The quality of care during the antenatal period may impact on the health of the pregnant woman and the outcome of the pregnancy, in particular on the still birth rate.

In primary health care services there are many factors which may impact on and influence the quality of antenatal care. For example with the implementation of the comprehensive primary health care services package (Department of Health, 2001a:21-35) changes at clinic level resulted in a large number of primary health care professional nurses having to provide antenatal care, who previously may only have worked with one aspect of the primary health care package such as minor ailments or childcare. Because skills of midwifery or antenatal care, had not been practiced by some of these professional nurses, perhaps since completion of basic training, their level of competence has declined, and they have not been exposed to new developments in the field of midwifery. The practice of primary health care nurses is also influenced by the impact of diseases not specifically related to pregnancy like HIV/AIDS and tuberculosis.

The principles of quality antenatal care are known (Chalmers et al. 2001:203) but despite the knowledge about these principles the maternal and perinatal mortality remains high. The Basic Antenatal Care quality improvement package is designed to assist clinical management and decision making in antenatal care. The

implementation of the BANC package may influence the quality of antenatal care positively, which in turn may impact on the outcome of pregnancy for the mother and her baby.

The aim of this study was to evaluate the effectiveness of the Basic antenatal care (BANC) package to improve the quality of antenatal care at primary health care clinics.

The objectives were:

- To assess the quality of antenatal care delivered by primary health care professional nurses in primary health care clinics
- To facilitate the implementation of the Basic Antenatal Care package in five selected experimental clinics
- To evaluate the effectiveness of the Basic Antenatal Care package by determining the quality of antenatal care by an audit of antenatal records
- To determine experiences of individuals of the training and implementation of the Basic Antenatal Care package
- To make recommendations and develop guidelines for training and implementation of the BANC package

The study design selected is a mixed method with a quantitative and a qualitative section. The study is explorative, descriptive, explanatory and contextual. The quantitative section of the study design is a quasi-experimental comparison group pretest-posttest design. A qualitative approach was used to make sense of the experiences of individuals involved in the training and implementation of the BANC package. A focus group discussion facilitated by an independent facilitator was used for data collection from the trainers of trainees involved in the implementation of the BANC package.

Results indicated that with the implementation of the BANC package:

- Organizational changes required at clinic level for improvement of antenatal care is facilitated with tools like the integrated flow charts for client management, management and referral protocols, and the checklist. It also supports the change to the new WHO schedule of visits for low risk pregnant women

- Women are provided the opportunity for antenatal care early in pregnancy illustrated by the reduction in gestational age at first visit
- The improvement of quality of antenatal care was small as measured in the experimental and the audit and feedback groups. However the significant continuous quality improvement in the experimental group measured in the ‘interpretation and decision’ section of the audit tool is a positive finding as it could impact on the outcome of pregnancy.

With the analysis of data generated by doing the focus group and individual interviews the following main themes were identified as

- Staff felt positive about the training
- Acting as a trainer was experienced as difficult
- The new approach holds benefits and challenges for service provision.

Guidelines, based on the research evidence are proposed to facilitate training and implementation of the BANC package.

Pregnancy may be natural but that does not mean it is problem free. Women rely on the health service for care and information during this crucial time (WHO, 2005b:41). The implementation of the BANC package can assist to re-organise services at primary health care level to optimise the impact of the professional nurses to improve the quality of care to pregnant women. With consistent use of the integrated approach included in the BANC package a difference may result in the outcomes of pregnancy and the health and survival of the woman and her newborn baby.

Key Words: Antenatal Care; Basic Antenatal Care Package; Quality; Cascade training; Audit; Guidelines;

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List of abbreviations used

AIDS	Acquired Immune Deficiency Syndrome
ARV	Antiretroviral therapy
BANC	Basic Antenatal Care Package
DHIS	District Health Information System
FCI	Family Care International
FIGO	International Federation of Obstetricians and Gynecologists
HIV	Human Immunodeficiency Virus
ICM	International Confederation of Midwives
IMCI	Integrated Management of Childhood Illnesses
IMPAC	Integrated Management of Pregnancy and Childbirth
IUGR	Intra-uterine Growth Restriction
MMR	Maternal Mortality Rate
NCCEMD	National Confidential Committee on Enquiries into Maternal Deaths
NMBM	Nelson Mandela Bay Metropole
PHC	Primary Health Care
PMTCT	Prevention of Mother to Child Transmission
PNMR	Perinatal Mortality Rate
PPIP	Perinatal Problem Identification Programme
SANC	South African Nursing Council
UNFPA	United Nations Population Fund
UNICEF	United Nations Children Fund
VCT	Voluntary Counseling and Testing for HIV
WHO	World Health Organization

1.1. Introduction

Pregnancy challenges the health care system in a unique way in that it involves at least two individuals – the woman and the fetus. The death rates of both pregnant women (maternal mortality) and newborns (perinatal mortality) are often used to indicate the quality of care the health system is providing. Care given to pregnant women, and thus the level of care in general, is reviewed through the assessment of maternal deaths.

In South Africa, since 1998, maternal deaths were assessed through the National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD), with findings published in the Saving Mothers Report (Pattinson, 2002: 37-135). In the process of assessing a maternal death, the patient's case records are reviewed by an experienced obstetrician and an advanced midwife. During this review the primary and secondary causes of death, contributing or aggravating factors, avoidable factors, missed opportunities, therefore substandard care is determined. The cause of death will firstly indicate if the death was pregnancy related or coincidental to pregnancy for example a motor vehicle accident is coincidental to pregnancy. If the cause is related to the pregnancy, it would then be further determined if the death could have been prevented by assessing the clinical care and management. For example if the cause of death was bleeding after delivery, one would assess the clinical management to look for omissions, inappropriate actions or delayed actions, which, if it was done in time, could have changed the outcome for the patient. A further step in assessment is to look for contributory or avoidable factors. In the example above, a delay in the availability of an ambulance could have contributed to the woman's death. One of the requirements for a unit where woman deliver babies is to have emergency blood available. An avoidable factor would be if emergency blood was not readily available for resuscitation of the woman. The review of maternal deaths is therefore a quality

audit of a small section of all pregnant women. The women who experience morbidity is not included in this assessment but it is argued that if the quality of care improves to a level where the number of maternal deaths is reduced, the care will improve for all pregnant women.

The Perinatal Problem Identification Programme (PIIP) is a perinatal care audit system whereby perinatal deaths (stillbirths and neonatal deaths) from selected sites are analysed in a similar manner as the confidential enquiry of maternal deaths. Only a small number of PIIP sites in South Africa have accurate data for an extended time period. Unlike the process for a maternal death, the audit of a perinatal death is done at facility level, with data entered into a computer programme. The computer programme facilitates amalgamation of data for different units. In the Saving Babies Reports Pattinson (2004: 4-22) used the amalgamated data to describe the situation of perinatal deaths for South Africa, including rates, causes and avoidable factors. Analysis of data from this report indicates that antenatal care is poor.

Improving antenatal care is essential if maternal and child health is to be improved, as antenatal care is the entry point to the health services and the point at which all aspects of care for the pregnant woman should be addressed. A reduction of maternal and perinatal deaths will reflect an improvement in quality of care over time. In this study quality of antenatal care is measured using a pre-designed audit tool (Philpott & Voce, 2001: 68-76) to illustrate improvement (or deterioration) of care provided to the pregnant woman. The implementation of the Basic Antenatal Care (BANC) package is seen as a possible measure to improve the quality of antenatal care in primary health care clinics.

1.2. Background and Literature Review

In terms of maternal and perinatal outcomes, South Africa scores poorly compared to other upper-middle income countries (Ijumba, Ntuli & Barron, 2004:90). The maternal death rate in highly developed countries is usually about 10 per 100 000 deliveries (Woods, Pattinson, & Greenfield. 2002:Unit 47), and in poor countries about 50 per 100 000 deliveries. An official maternal mortality rate (MMR) is not yet available for South Africa, but the true rate is believed to be close to 150 maternal

deaths per 100 000 live births (Department of Health, 2002: 4). The Second Saving Mothers Report 1999-2001 (Pattinson, 2002:1) estimates the MMR as 175-200/100 000 live births. The First South African Confidential Enquiries into Maternal Deaths Report 1998 (Pattinson, 1999:7) suggests that the main causes of maternal deaths are related to failure to use health care facilities, inadequacy of services and substandard care. The “big five” causes of maternal deaths are non-pregnancy related infections (mainly AIDS), complications of hypertension in pregnancy, obstetric haemorrhage, pregnancy related sepsis and pre-existing medical conditions (Pattinson, 1999:7). The Second Saving Mothers Report 1999-2001 describes AIDS and complications of hypertension as the top two causes of maternal deaths (Pattinson, 2002:35-52). The Third Saving Mothers Report 2002-2004 (Pattinson, 2006:7) reports no change in the top five causes of maternal deaths. In this report non-pregnancy related infections were the most common cause of death at all levels of care contributing to 37.8% of deaths. No attendance at antenatal care was listed in 18.1% of the cases that could be assessed for missed opportunities and substandard care (Pattinson, 2006:10).

Programmes which can impact on these problems have been initiated for example, voluntary counselling and testing (VCT) for Human Immunodeficiency Virus (HIV), prevention of mother to child transmission (PMTCT) and antiretroviral therapy (ARV), all of which target the pregnant woman during antenatal care. Evidence is available to show that supplementation of 1.5g calcium daily, given orally to pregnant women reduces the prevalence of pregnancy induced hypertension and pre-eclampsia in areas where there is a deficient dietary calcium intake (Atallah, Hofmeyer & Duley, 2002: Cochrane Library) but this has not yet been accepted as policy and has yet to be implemented. One area of substandard care identified in the Second Saving Mothers Report 1999-2001 (Pattinson, 2002:6), was the poor initial assessment of the antenatal patient. This occurred in about 30% of cases. According to this report health care provider related avoidable factors in the management of the event that lead to the women’s death at the primary level of care was identified in just under three quarters of cases.

The perinatal mortality rate (PNMR) for South Africa is difficult to determine, as the number of deaths and births is not known for the country (Ijumba, Ntuli & Barron, 2004:90). The Saving Babies Report 2003 presents data from 462 348 births and

12773 perinatal deaths (Pattinson, 2004:4) based on a survey making use of the Perinatal Problem Identification Program (PPIP) at volunteered PPIP sites throughout South Africa. Perinatal data is captured and reported per weight category of the fetus unlike in the District Health Information System (DHIS), where only the total number of deaths is captured. According to the Saving Babies 2003 report the PNMR for South Africa is 27.6/1000 live births. The still birth rate is 17.88/1000 and the neonatal death rate 9.9/1000 with the stillbirth neonatal death ratio 2:1. Unexplained stillbirths are the most common recorded category of perinatal death with the most likely causes of these deaths, reported in the Saving Babies Report 2003 (Pattinson, 2004:4), as intrauterine growth restriction (IUGR), post-maturity, congenital abnormalities and uro-genital infections in the mother. All of these conditions can be detected during good antenatal care. If the woman attends antenatal care, according to Moran & Mangate (2004:23-37), deaths resulting from IUGR, post-maturity and syphilis can be avoided. Although poor or no attendance at antenatal care was recorded as an avoidable factor in one in five cases of unexplained stillbirths in the Saving Babies Report 2003 (Pattinson, 2004:22-36), the majority of women did attend antenatal care. Furthermore the South African Health Review indicates that 95% of women countrywide attend antenatal care when pregnant (Ijumba, Ntuli & Barron, 2002:94). Therefore the high proportion of unexplained stillbirths is probably a good indication that the quality of antenatal care is poor (Pattinson, 2004:4-22).

Perinatal mortality data per weight category for an extended period is available from a survey in the West of Pretoria (Atteridgeville) (Pattinson & Delpport, 2004:199). This survey of perinatal care in Atteridgeville (see figure 1 and 2) has indicated that over the last decade, the significant drop in the perinatal mortality has been due to significant declines in neonatal deaths (Pattinson & Delpport, 2004:199). The survey further indicates that the stillbirth rate remained constant for the decade. Figure 1. illustrates the decline in neonatal death rate recorded in Atteridgeville (Pretoria West) over the period 1994 to 2003. Various interventions resulted in this decline but despite these no significant decline was recorded in the stillbirth rate (see figure 2) of the same population as illustrated by Pattinson & Delpport (2004:199).

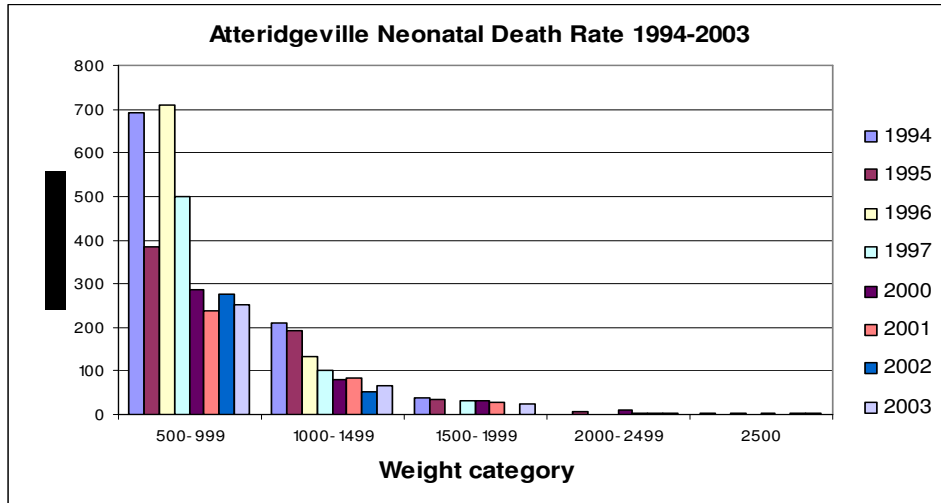


Figure 1.1. Atteridgeville: Neonatal Death Rate for the period 1994-2003 per weight category

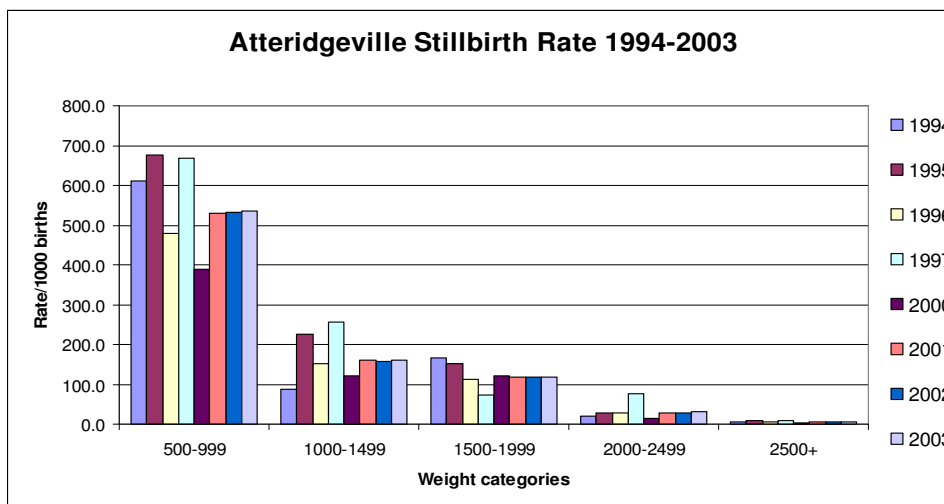


Figure 1.2. Atteridgeville Stillbirth Rate for the period 1994- 2003 per weight category

Perinatal mortality data per weight category over an extended period of time for the Eastern Cape is not readily available. As far as could be determined only two sites in the Eastern Cape using the PPIP program have such data, namely Uitenhage and Settlers hospitals. Uitenhage is part of the Nelson Mandela Bay Metropole and has been a PPIP site since 1998. In analysing the data from Uitenhage Hospital the researcher found a similar pattern of perinatal death as for the Atteridgeville population, illustrated in figure 1.3 and 1.4 below. The neonatal death rate declined

over the period 1998 to 2006, yet the stillbirth rate for the same period remained constant.

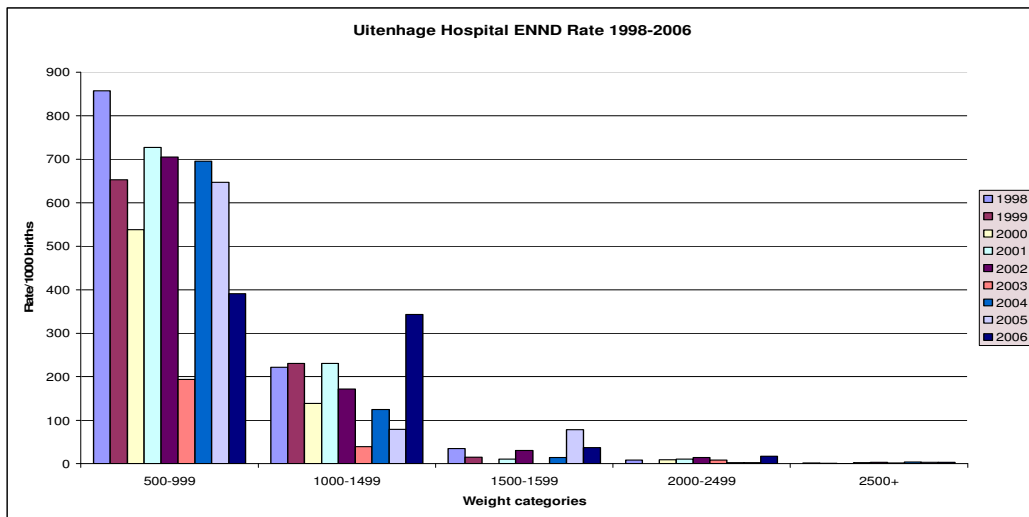


Figure 1.3. Uitenhage Hospital: Neonatal Death Rate for the period 1998-2006 per weight category

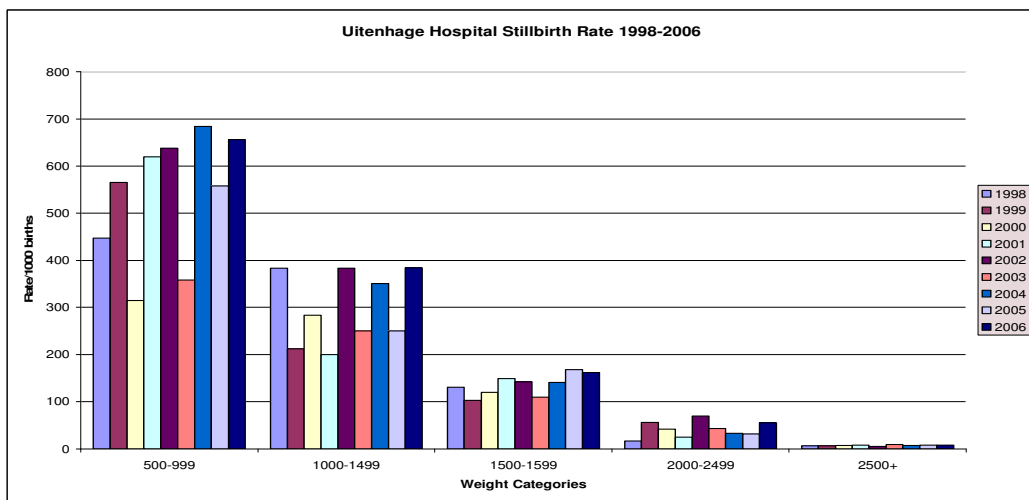


Figure 1.4. Uitenhage Hospital: Stillbirth Rate for the period 1998-2006 per weight category

In the Uitenhage population unexplained intra uterine death was cited in 35.2% of perinatal deaths. Therefore the high proportion of unexplained stillbirths is probably a good indication that the quality of antenatal care in the Nelson Mandela Metropole is poor.

The World Health Report 2005 (WHO, 2005b:42) states that while antenatal care coverage has improved significantly in recent years, it is generally recognised that the antenatal care services currently provided in many parts of the world fail to meet the recommended standards. Improving antenatal care can improve maternal health, which in turn can improve the health and survival of the baby. The World Health Organisation (2003, 1-2) states that the “*focus of antenatal care interventions should be on improving maternal health, this being both an end in itself and necessary for improving the health and survival of infants.*”

1.2.1. Principles of quality antenatal care

The antenatal period is an occasion that brings the pregnant woman in contact with the health service, for many women the first contact with the health care system. The provision of a high quality comprehensive care during this period could influence the general health of the woman and her unborn child. The antenatal period provides the primary health care professional nurse the opportunity to provide care and information related to the pregnancy. An example of information that should be provided is the danger signs of high risk conditions like a reduction in fetal movement, which if experienced by the woman, should motivate her to seek health care. The antenatal period also provides an opportunity to screen for and provide information on non-pregnancy related diseases such as HIV/AIDS and tuberculosis, which may influence the general health of the pregnant woman. The question then arises as to what would be a high quality or effective antenatal service provided within the current context? In support of evidence-based care the World Health Organisation (WHO) developed ten principles reflecting effective perinatal care (Chalmers, Mangiaterra, & Porter, 2001:203). These comprise the following:

- I. Care for normal pregnancy and birth should be de-medicalised, meaning that essential care should be provided with the minimum set of interventions necessary and that less rather than more technology be applied whenever possible.
- II. Care should be based on the use of appropriate technology, which is defined as a complex of actions that includes methods, procedures, techniques, equipment, and other tools, all applied to solve a specific problem. This principle is directed

toward reducing the overuse of technology or the application of sophisticated or complex technology when simpler procedures may suffice or indeed be superior.

- III. Care should be evidence based, meaning supported by the best available research, and by randomized controlled trials where possible and appropriate.
- IV. Care should be regionalised and based on an efficient system of referral from primary care centres to tertiary levels of care.
- V. Care should be multidisciplinary, involving contributions from health professionals such as midwives, obstetricians, neonatologists, nurses, childbirth and parenthood educators, and social scientists.
- VI. Care should be holistic, and should be concerned with intellectual, emotional, social, and cultural needs of women and their babies and families and not only their biological care
- VII. Care should be family centred and should be directed toward meeting the needs of not only the woman and her newborn baby but also her partner and significant family or friends.
- VIII. Care should be culturally appropriate and should consider and allow for cultural variations in meeting these expectations.
- IX. Care should involve women in decision making
- X. Care should respect the privacy, dignity and confidentiality of women (Chalmers, Mangiaterra, & Porter, 2001:203).

Disseminating the concepts and implementing them in practice are the current challenges facing those who wish to implement evidence based care worldwide (Chalmers, et al. 2001:203).

In the National Guidelines for Maternity Care in South Africa (Department of Health, 2002:18) the principles of antenatal care is reflected in the objectives. Antenatal care attempts to ensure, by antenatal preparation, the best possible pregnancy outcome for women and their babies. This may be achieved by:

- Screening for pregnancy problems
- Assessment of pregnancy risk
- Management of problems that may arise during the antenatal period
- Administration of medicines that may improve pregnancy outcome
- Provision of information to pregnant women

- Physical and psychological preparation of women for childbirth and parenthood

The quality of antenatal care is influenced by a multitude of factors. Knowledge of the principles of quality of care is important, but the adherence to these principles is influenced by the environment or context in which women receive antenatal care services. The focus of this study is the quality of antenatal care. Antenatal care is included as part of the comprehensive primary health care services package (Department of Health, 2001a:21-35) and is provided by professional nurses working in primary health care clinics.

The practice of primary health care nurses is influenced by the impact of non pregnancy related diseases for example HIV and AIDS. Implementation of programs to support HIV positive pregnant women, for example the voluntary counselling and testing (VCT), prevention of mother to child transmission (PMTCT) and anti retroviral programmes (ARV), adds to the workload of the already over stretched primary health care personnel, yet is very important in improving the health of the woman and prevention of transmission to the baby.

1.2.2. Antenatal Care Services in Nelson Mandela Bay Metropole

The 2003 Facilities Survey (Roberts, 2004:1-10) provided an in-depth assessment of PHC services and noted that antenatal care is provided in only half of PHC facilities. Indicators show that the health system is inadequately prepared to provide the required level and quality of care (Roberts, 2004:6). Antenatal care in the Nelson Mandela Bay Metropole is provided in 16 of the 53 primary health care clinics (Department of Health, District Health Information System: Accessed August 2005). The percentage of women attending antenatal care for the first time at a gestational age of less than 20 weeks is 25% (Department of Health, District Health Information System: Accessed August 2005). Attending late for the first visit has several implications in the care of the woman. If the pregnancy is unwanted the opportunity to counsel the woman for a termination of pregnancy can no longer be offered. Risks for the mother and fetus for example syphilis, hypertension, diabetes, cardiac disease and nutrition status would not be identified early for management and referral. Providing health information to pregnant women is an important aspect of antenatal care for

example the danger signs of risk conditions for which the woman need to seek health care immediately for assessment and management. Without this knowledge the woman may not report these risk factors if present, with a detrimental effect on her own health and the well being of the fetus. Information on healthy lifestyle and care and nutrition of her infant is equally important to equip the mother for future life tasks.

The National Guidelines for Maternity Care in South Africa (Department of Health, 2002:18) states that *'all women that attend antenatal care should be issued with an antenatal card'*. The antenatal card is the principal document of the health history and care received by the pregnant women. The antenatal card is carried by the pregnant woman and is an important form of communication between the health providers at primary health care clinics and the delivery unit or referral hospital. Information includes for example history of previous and present pregnancies, the findings of the examination of the woman, the expected date of delivery, investigation results and a graph to illustrate the growth of the fetus. If the required information on the antenatal care is not recorded it may negatively influence decisions and management of the pregnant woman.

Antenatal care is included as part of the comprehensive primary health care services package (Department of Health, 2001a:21-35) and is provided by professional nurses working in primary health care clinics. The implementation of the PHC package affected the provision of antenatal care services. Antenatal care in South Africa has changed from being a vertical system (where antenatal care was provided on specific days at special clinics by experienced midwives whose only function was antenatal care) to a horizontal system (where antenatal care is provided by most clinics, every day, by every professional nurse at the clinic, or the 'one stop shop' approach). This resulted in a large number of professional nurses now having to provide antenatal care, who previously may only have worked with one aspect of the PHC package, such as minor ailments and childcare. Although qualified in terms of the SANC stipulations, these nurses were not in the past required to practice midwifery skills. Because skills of midwifery or antenatal care, had not been practiced by some of these professional nurses, perhaps since completion of basic training, their level of

competence has declined, and they have not been exposed to new developments in the field of midwifery.

The issues discussed above motivated the researcher to search for ways to measure and improve the quality of antenatal care provided to women at primary health care clinics in the Nelson Mandela Bay metropole.

1.2.3. Integrated management approach to antenatal care

The World Health Organisation (WHO) produced a quality improvement package consisting of clinical management flow charts, titled: Integrated Management of Pregnancy and Childbirth. Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice (WHO, 2003:A-G). This package is endorsed by the International Federation of Gynaecology and Obstetrics (FIGO), the International Paediatric Association and the International Confederation of Midwives (WHO, 2003:1). Pattinson (Director, MRC Unit for Maternal and Infant Health Care Strategies) adapted the generic flow charts on antenatal care for South Africa's conditions and a multimedia **Implementation Package for Basic Antenatal Care (BANC)** was developed. The BANC Package includes a purpose written **Basic Antenatal Care Reader** and **Training of Trainers modules** to guide users through the implementation process. The complete package is discussed in Chapter Two.

The clinical management flow charts (See figure 1 .5 below) in the BANC package are tools for clinical decision-making for different risk factors and conditions that may present during pregnancy. Each flow chart is presented in a framework using different colors to indicate the severity of a condition. For example, red for emergencies, yellow for less urgent conditions which nevertheless need attention, and green for normal care. The framework is based on a syndromic approach whereby the primary health care nurse identifies a limited number of key clinical signs and symptoms, enabling her/him to classify the condition according to severity and then give appropriate treatment. The flow charts are cross-referenced for ease of use.

CHECK FOR PRE-ECLAMPSIA

Screen all pregnant women at every visit.

ASK/CHECK/RECORD LOOK/LISTEN/FEEL

- Blood pressure at the last visit?
 - Measure blood pressure in sitting position.
 - If diastolic blood pressure is ≥ 90 mmHg, repeat after 1 hour rest.
 - If diastolic blood pressure is still ≥ 90 mmHg, ask the woman if she has:
 - severe headache
 - blurred vision
 - epigastric pain and
 - check protein in urine.

SIGNS

- Diastolic blood pressure ≥ 110 mmHg and 3+ proteinuria, or
- Diastolic blood pressure ≥ 90 mmHg on two readings and 2+ proteinuria, and any of:
 - severe headache
 - blurred vision
 - epigastric pain.

CLASSIFY

SEVERE PRE-ECLAMPSIA

- Give magnesium sulphate **B13**
- Give appropriate anti-hypertensives **B14**
- Revise the birth plan **C2**
- Refer urgently to hospital **B17**

PRE-ECLAMPSIA

- Revise the birth plan **C2**
- Refer to hospital.

HYPERTENSION

- Advise to reduce workload and to rest.
- Advise on danger signs **C3**
- Reassess at the next antenatal visit or in 1 week if < 8 months pregnant.
- If hypertension persists after 1 week or at next visit refer to hospital or discuss case with the doctor or midwife, if available.

- None of the above.

NO HYPERTENSION

- No treatment required.

NEXT: Check for anaemia

Assess the pregnant woman ▶ Check for pre-eclampsia

C3

Figure 1.5. Example of an antenatal flow chart from the basic antenatal care package.

The BANC package provides clear guidelines to assess pregnant women and should assist the primary health care nurse to separate pregnant women who require basic care from those pregnant women requiring additional care and referral. A checklist, allowing for accurate clinic documentation of the care of the woman without duplication of records, is also included as part of the package. The Basic Antenatal Care (BANC) package describes the minimum antenatal care that every pregnant woman should receive. Every aspect is based on best evidence and only aspects that have been shown to be effective are included. The care has been simplified to enable every primary health care professional nurse to perform basic antenatal care.

1.3. Research Problem

In terms of maternal and perinatal outcomes South Africa scores poorly compared to other upper-middle income countries (Penn-Kekana & Blaauw, 2002:14). The high stillbirth rate compared to the neonatal death rate reflects poor quality of antenatal care. Maternal and perinatal mortality is recognised as a problem and as a priority for action in the Millennium Development Goals (Thieren & Beusenberg, 2005:11). The Saving Mothers (Pattinson, 2002: 37-135) and Saving Babies (Pattinson, 2004:4-35) reports describe the causes and avoidable factors of these deaths with recommendations on how to improve care. The quality of care during the antenatal period may impact on the health of the pregnant woman and the outcome of the pregnancy, in particular on the still birth rate.

In primary health care services there are many factors which may impact on and influence the quality of antenatal care. For example with the implementation of the comprehensive primary health care services package (Department of Health, 2001a:21-35) changes at clinic level resulted in a large number of primary health care professional nurses having to provide antenatal care, who previously may only have worked with one aspect of the primary health care package, such as minor ailments or childcare. Because skills of midwifery and antenatal care had not been practiced by some of these professional nurses, perhaps since completion of basic training, their level of competence has declined, and they have not been exposed to new developments in the field of midwifery. The practice of primary health care nurses is

also influenced by the impact of diseases not specifically related to pregnancy like HIV and AIDS and tuberculosis.

The principles of quality antenatal care are known (Chalmers et al. 2001:203) and are reflected in the National Guidelines for Maternity Care in South Africa (Department of Health, 2002:18). Despite the knowledge about these principles the maternal and perinatal mortality remains high. The Basic Antenatal Care quality improvement package is designed to assist clinical management and decision making in antenatal care. The implementation of the BANC package may influence the quality of antenatal care positively, which in turn may impact on the maternal and perinatal mortality.

This information led the researcher to the following questions:

- What is the quality of antenatal care in primary health care clinics in the Nelson Mandela Bay Metropole?
- How can the BANC package be implemented?
- Would the implementation of a specifically designed antenatal care package (BANC) improve the quality of antenatal care provided by primary health care professional nurses as measured by the auditing of antenatal cards?
- How would individuals experience the training and implementation of the BANC package?
- What can be done to ensure that the BANC package is implemented successfully?

Describing the problem (Burns & Grove, 2005:36-38) led the researcher to formulate a number of research questions which assisted to clarify the aim of the study, and directed the development of the study design.

1.4. Research Aim

The aim of this study is to evaluate the effectiveness of the Basic antenatal care (BANC) package to improve the quality of antenatal care at primary health care clinics.

1.5. Research Objectives

The objectives of this study are:

- To assess the quality of antenatal care delivered by primary health care professional nurses in primary health care clinics
- To facilitate the implementation of the Basic Antenatal Care package in five selected experimental clinics
- To evaluate the effectiveness of the Basic Antenatal Care package by determining the quality of antenatal care by an audit of antenatal records
- To determine experiences of individuals involved in the training and implementation of the Basic Antenatal Care package
- To make recommendations and develop guidelines for training and implementation of the BANC package

1.6. Definition of Concepts

○ Antenatal Care

Antenatal refers to the period preceding birth of the infant (Stedman's Medical Dictionary, 2005:1182). Care is a general term for the application of knowledge to benefit a person, family or community or to provide a health care related service to a patient (Stedman's Medical Dictionary, 2005:238). Antenatal care is the care given by the midwife to the pregnant woman, during the time in the maternity cycle that begins with conception and ends with the onset of labour (Urdang, 1983: 63&881).

○ Antenatal patient

An antenatal patient is a pregnant woman seeking antenatal care (or service) from a health institution during pregnancy.

○ Basic Antenatal Care (BANC) Package

The Basic Antenatal Care (BANC) Package is a quality improvement training package based on the Integrated Management of Pregnancy and Childbirth programme of the WHO (WHO, 2003:C1-C18). It incorporates integrated flow charts for clinical decision making related to antenatal care. It also includes the training

material based on the trainers of trainees methodology, required to cascade training at clinic level.

- **Master Trainer**

The Master Trainer is a professional nurse trained in the BANC Package and equipped to train the Trainers of Trainees. In this study the researcher was trained as a master trainer.

- **Maternal Death**

A maternal death is the death of a woman during pregnancy from conception up to six weeks (42 days) after the birth of the baby (Pattinson, 1999: viii).

- **Maternal mortality rate (MMR)**

Maternal mortality rate is the number of maternal deaths during one year, divided by the number of women in the reproductive age group in the same year, expressed by 100,000 (Pattinson, 2006:31).

- **Maternal mortality ratio**

The number of deaths related to pregnancy over one year, divided by the total number of live births over the same year, expressed per 100,000 live births. The accuracy of the maternal mortality ratio will rely on the accuracy of the maternal deaths reported as well as the number of births registered (Pattinson, 2006:31)

- **Morbidity**

Morbidity is where damage or illness occurs to the patient (mother or baby) or a diseased state (Stedman's Medical Dictionary, 2005:942).

- **Neonatal death**

Neonatal death refers to the death of a baby who dies within 28 days of birth, weighing more than 500gm or with a gestational age of 28 weeks or more. Early neonatal death occurs within the first 7 days of birth and late neonatal death occurs after 7 days of birth but before 28 days of age (Woods, Pattinson & Greenfield, 2002:Unit 48).

- **Perinatal death**

A perinatal death refers to the death of a baby weighing more than 500gm at birth and/or has a gestational age of 28 weeks or more, up to the age of 28 days. It includes stillbirths as well as neonatal deaths (Woods, Pattinson & Greenfield, 2002:Unit 48).

- **Perinatal mortality rate (PNMR)**

The perinatal mortality rate is the number of stillbirths plus neonatal deaths in a time period divided by the number of births for the same period. The PNMR is expressed per thousand births (Pattinson, undated:79).

- **Perinatal Problem Identification Programme (PIIP)**

PIIP is a computerised version of the **ICA Solution** audit system (Pattinson, undated:28-30). (**I**dentification of perinatal deaths and all deliveries; **C**ause of perinatal deaths; **A**voidable factors; **S**olution). Although widely used in South Africa only a limited number of facilities or sites have data for extended periods of time. In this programme data is captured per weight category for infants, whereas in the District Health Information system only total numbers are captured.

- **Pregnancy**

Pregnancy refers to the gestational process, comprising the growth and development within a woman of a new individual from conception through the embryonic and fetal periods to birth (Urdang, 1983:876).

- **Primary Health Care Clinics**

A basic level of health care facility that delivers programmes directed at the promotion of health, early diagnosis of disease and disability, and prevention of disease (Urdang, 1983: 886). Primary health care services refer to the basic health care services provided at the lowest level of the health system, usually by clinics, community health centres and district hospitals. These services include basic child and maternity care (Nicholson, Undated: 27). In this study reference to a primary health care clinic will include a midwife obstetric unit and antenatal care clinic.

- **Professional Nurses**

These are individuals who completed a prescribed course through a tertiary education institution and fulfilled the basic requirements of the South African Nursing Council to be registered to practice under the regulations of the Nursing Act (The Nursing Act, no. 50 of 1978) as professional nurses. In South Africa most professional nurses are also qualified as midwives. In this study professional nurses refer to those professional nurses providing a primary health care service, which includes antenatal care. The term primary health care professional nurses will be used.

- **Research assistants**

Research assistants in this study will be primary health care professional nurses employed at the selected clinics, in a supervisory position, or the professional nurse in charge of the facility. The person would be delegated the task, with permission and cooperation from the managers, to assist with scoring of antenatal cards.

- **Stillbirth**

The legal definition of a stillbirth in South Africa is an infant born dead after 6 months of intra-uterine life i.e. 28 weeks since the start of the last menstrual period or 26 weeks since conception. Infants that are born dead before this time are legally regarded as miscarriages. If the gestational age is not known, a weight of 1000gm is used to legally define a stillbirth. Internationally any infant who is born dead and weighs 500g or more is defined as a stillbirth. The normal fetus weighs 500g at about 22 weeks gestation (Woods, Pattinson & Greenfield, 2002:Unit 48).

- **Trainer of trainees**

The research assistants for the experimental clinics will be trained as the Trainers of trainees, and will be expected to train primary health care professional nurses at clinic level for the implementation of the Basic Antenatal Care package.

1.7. Paradigmatic Perspective

A paradigm is described as a world-view of a discipline (Bryar, 1995:24). A paradigm consists of theoretical ideas and technical procedures that researchers adopt which are rooted in a particular worldview with its own language and terminology (Holloway &

Wheeler, 2004:6). A paradigm implies standards or criteria for assigning value or worth to the methods of knowledge development within a discipline (Chinn & Kramer, 1995:106). This study will be based on the Health for All model (WHO, 1998:5) with the goal that all the world's citizens should enjoy health by 2000. Further to this model this study will recognise the metaparadigms influencing the practice of nursing described by Kotze (1998, 3-14) in the nursing accompaniment theory. These are now briefly discussed.

1.7.1. Health for All

The 'Health for All' model developed by the World Health Organisation (WHO) is applied to this study. The Health for All model focuses on the community, the environment and the wider strategies needed to support and promote health in its widest sense. The Health for All model was developed by the World Health Organisation and stated in the Declaration of Alma-Ata in 1978 (WHO, 1998:5). It is a model developed at the level of international society but which seek to bring about radical change in the structures of health care organisations, the wider views in societies regarding health, the attitudes of health care practitioners and members of the community and the provision of health care. Recognition of the millennium development goals, the right of the pregnant women to quality antenatal care and the impact this may have on the health of pregnant women and their newborn babies, links with the Health for All Policy which will now be discussed briefly.

As early as 1977 the WHO (World Health Organisation) created a framework to help translate the vision of universal health into strategy and policy with the goal that all the world's citizens should enjoy health by 2000. This level of health would allow them to lead socially active and economically productive lives. This vision became known as the 'Health for All' and was introduced at Alma Ata in 1978 (WHO, 2005a:9). Three values underwrite the Health for All approach namely equity, solidarity and participation, and it is recognized that quality of care contributes significantly to a populations' health status (WHO, 2005a:11). The four types of programme efforts advocated by the WHO focus on patient care, prevention, promotion of healthy lifestyles and addressing health determinants. Mechanisms to ensure the continuous improvement of health services have become increasingly

important. The benefits of quality improvement include better health, improved relations between the general public and health professionals, and a decrease in costly failures in patient management (WHO, 2005a:15).

Further to these values are the general human rights which need to be acknowledged and applied in all health care settings (WHO, 2005a:40-41). Health and human rights are closely interrelated. In South Africa these rights are outlined in The Constitution of South Africa (Act 108 of 1996) as the Bill of Rights. Health is affected by many social, economic, environmental, cultural and political factors and respecting the right to health requires that other human rights be respected, too.

A further step to achieve Health for All was when in 2000, representatives from 189 countries adopted the United Nations Millennium Declaration (WHO, 2005a:57-58). This declaration identifies eight development goals that every country is to strive for to meet by 2015. Goals 4 (Reduce child mortality) and 5 (Improve maternal health) are directly related to the care of children and pregnant women.

The Health for All model provides the framework for taking up challenges of achieving better health by applying the best strategies that emerged from collective experience (WHO, 1999:14). The aim and objectives of this study is in line with the Health for All model and the principles of working towards the millennium development goals.

1.7.2. Nursing accompaniment theory

Further to the Health for All model this study will be based on the metaparadigms influencing the practice of nursing described by Kotze (1998, 3-14) in the nursing accompaniment theory. From this viewpoint:

- * Man is accepted as a multidimensional being who is open and continually becoming/changing and who constantly chooses between right and wrong on the basis of a personal view of the world, life, man, work and a personal value system
- * Man is continually concerned with norms which he either obeys or disobeys

- * Nursing is accepted as a phenomenon which is only possible on a human level. Nursing is an interpersonal event (Kotze, 1998:3).

Within this paradigmatic framework Kotze (1998:4) identified and described the following concepts which are supported in this study:

- **Man/Human Being/Person**

Man is a unique multidimensional total being, indivisibly body-psyche-spirit, continuously becoming within an inseparable dynamic relationship with world, time, fellow-beings and God (Kotze,1998: 4). In this study, with the focus on antenatal care, man refers to the dyad of the pregnant woman and her unborn baby. Man also has reference to the professional nurse working in primary health care clinics in the Nelson Mandela Bay Metro.

- **World**

World refers to the world in which man exists, consisting of:

- Objective or external world: This world includes the world of science and technology, nature, ecology, astronomy, and micro-organisms. The external world in this study would refer to the primary health care clinic where antenatal care is provided to pregnant women (man) by the primary health care professional nurses (man).
- Subjective or life-world: The subjective world includes the personal world, the interpersonal world of co-existence and the dimension of time in which man exists (Kotze,1998: 4). The life-world for this study would refer to the inner process of grappling with change, within the pregnant woman exposed to a different schedule of visits and the primary health care nurse who have to gain and implement new knowledge and a different approach to antenatal care.

- **Health**

Health refers to the state of wellness or illness of an individual. It is a dynamic process relating to the degree of ability or inability of a person as body-psyche-spirit

to maintain him/herself optimally in relationships (Kotze, 1998:4). This study is concerned with the health of the mother, as her health has a direct influence on the outcome or health and well being of the fetus, the birthing process and the health of the baby. The pregnant woman may present at a primary health care clinic in different degrees of illness or wellness encompassing the whole spectrum of physical and mental disease.

- **Nursing**

Nursing is an interpersonal, comprehensive service to man at all stages of life, ill or well, which encompass a dynamic, systematic process of management, clinical care and teaching, of which accompaniment is inherently part, so as to affect change that would facilitate prevention of illness, disability and suffering, promotion and regaining of wellness, and where this is not possible, would facilitate peaceful, dignified death (Kotze, 1998:4). This study focuses on the pregnant woman. The role of the nurse in a primary health care clinic is to assist, support, motivate and teach the pregnant woman to maintain optimum health while pregnant. The nursing care provided focuses on the promotion of health in the mother to provide the best possible conditions for the unborn baby to develop and grow, and reach its full potential as a unique human being. The early identification and referral of risk factors contributes to the health of the pregnant woman and her unborn baby.

Against these paradigms the research design will be described.

1.8 Research Design

The research design is the overall plan or blueprint for how to obtain answers to the questions being asked. The design specifies which of the various types of approaches will be adopted to best answer the research questions (Polit & Hungler, 1995:32; Mouton, 2005:55). The study design selected is a mixed method with a quantitative and a qualitative section. The study is, explorative, descriptive, explanatory and contextual. These concepts are now briefly discussed.

1.8.1. Mixed Method Research

Mixed method as described by Creswell (2003: 208-226) focuses on collecting and analysing both quantitative and qualitative data in a single study. Integration of the data might occur at several stages in the process of research: the data collection, the data analysis, interpretation, or some combination of places. Integration means that the researcher “mixes” the data (Creswell, 2003:215). This study is characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data, described by Creswell (2003:216) as the sequential explanatory strategy. Data will only be integrated during the interpretation of findings. By combining and increasing the number of research strategies one is able to broaden the dimensions and hence the scope of the study (Tashakkori & Teddlie, 2003:189).

1.8.1.1. Quantitative Research

According to Reaves (1992:16) in quantitative research issues of measurement are of primary importance. A quantitative study may be defined as an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers and analysed with statistical procedures in order to determine whether predictable generalisations of the theory holds true (De Vos, Strydom, Fouche & Delport, 2004:79). Quantitative research is a formal, objective, systematic process in which numerical data are used to obtain information about the world (Burns & Grove, 2005:23). The first section of this study collects data making use of an audit tool generating data which may then be statistically analysed. The quantitative section of the study design is a quasi-experimental comparison group pretest-posttest design (De Vos, et al. 2004:145-146).

Quasi experimental designs help researchers test for causal relationships in a variety of situations where the classical experimental design is difficult or inappropriate. They are called quasi because they are variations of the classical experimental design (Neuman, 2003:247) yet as Reaves (1992:199) states both groups that is the experimental and control groups are measured before and after the change in the independent variable. The major identifying characteristic of a quasi-experimental design is the lack of randomisation (Bless, Higson-Smith & Kagee, 2006:80), yet

there is manipulation of the independent variable, in this study the training and implementation of the BANC package. In this study in both the experimental and the control group the quality of antenatal care will be audited before and after intervention. The intervention which is the training and implementation of the BANC package will only be done in the experimental group.

1.8.1.2. Qualitative research

Qualitative research aims mainly to understand social life and the meaning that people attach to everyday life. In its broadest sense it refers to research obtaining participant accounts of their meaning, experience or perceptions. It produces descriptive data in the participant's own written or spoken words. The qualitative researcher is therefore concerned with understanding rather than explanation; naturalistic observation rather than controlled measurement; and the subjective outsider perspective (De Vos, et al. 2004:79; Burns & Grove, 2005:52). Qualitative research is a form of social inquiry that focuses on the way people interpret and make sense of their experiences and the world in which they live (Holloway & Wheeler, 2004:3). This study has a qualitative component to explore experiences of the participants during the training and implementation of the BANC package.

1.8.2. Explorative Research

Explorative research focuses on the unknown or lack of basic information. Exploratory research may be the first stage in a series of studies. The purpose of exploratory research is to investigate phenomena or situations that are not familiar, and tends to be primarily descriptive (Reaves, 1992:9). The purpose of exploratory research is to gain a broad understanding of a situation, phenomenon, community or person (Bless, Higson-Smith & Kagee, 2006:47). This study will explore the effect of the implementation of the BANC package on the quality of antenatal care in primary health care clinics. This package has not previously been implemented in South Africa; therefore its effect and issues affecting implementation is unknown. In the qualitative section the experiences of the individuals involved with the intervention clinics will be explored to understand how they perceived the training and

implementation of the BANC package. This new knowledge will assist to draft recommendations for future implementation.

1.8.3. Descriptive Research

Descriptive research can be described as research to observe, describe and document aspects of the situation as it occurs naturally (Polit & Hungler, 1995:178). Descriptive research presents a picture of the specific details of a situation, social setting or relationship (De Vos, et al. 2004:109). This study will use statistical data to describe the quality of antenatal care in primary health care clinics. Data obtained through individual interviews and a focus group discussion will be used to describe the experiences of the individuals involved in the training and implementation process of the BANC package. A rich description will be given of the methodology used.

1.8.4. Explanatory Research

Explanatory research will normally be conducted when a researcher encounters an issue that is already known and had a description to it, but he/she is prompted to ask why things are the way they are (De Vos, et al., 2004:109). Explanatory research involves examining a cause-effect relationship between two or more phenomena (Dane, 1990:7). Explanatory research tries to demonstrate that one variable can cause the other. This study aims to explain the effect of the training and implementation of the BANC Package (independent variable) on the quality of antenatal care (dependant variable) provided in primary health care clinics.

1.8.5. Contextual Research

Contextual research is concerned with identifying what exists in the social world and the way it manifests itself (Ritchie & Lewis, 2003:27). A contextual study pertains to the immediate environment of the participant (Mouton, 2005:133). Researchers must be sensitive to the context of the research and immerse themselves in the setting and situation (Holloway & Wheeler, 2004:11). The researcher has to take into account the conditions in which data is gathered, the locality, the time and the history, and respect the context and culture in which the study takes place.

The context of this study is the health service platform of the Eastern Cape and will take place in the Nelson Mandela Bay Metropole, one of seven district of the Eastern Cape Province. The metropole include Port Elizabeth, Uitenhage and Despatch, with a population of ±1,2 million people of diverse cultures.

This study will focus on the clinics providing primary health care services, including antenatal services, in the Nelson Mandela Bay Metropole. The training and implementation of the BANC package will result in unique experiences for the participants. An in-depth description is needed to understand how this may relate to the quality of antenatal care provided.

The research method with a focus on the research process (Mouton, 2005:56) and the kind of tools and procedures to be used will now be discussed.

1.9. Research Method

Research methodology is the section in the research report that describes how the research will be conducted (Reaves, 1992:354). The two phases of this study is set out in Table 1.1. below. The implementation of this plan will be discussed in more detail in Chapter Three.

1.9.1. Phase 1: The effectiveness of the BANC Package to improve the quality of antenatal care in primary health care clinics will be determined

Objectives are to:

- Assess the quality of antenatal care delivered by primary health care professional nurses in primary health care clinics
- Facilitate the implementation of the Basic Antenatal Care package in five selected experimental clinics
- Assess the effectiveness of the Basic Antenatal Care package by determining the quality of antenatal care
- Determine experiences of individuals involved in the training and implementation of the Basic Antenatal Care package

Steps	Research Population and Sample	Data Gathering Method	Data Analysis Method
Step1: Literature Review A literature review will be done to obtain a general overview of the research problem.			
Step 2 : The pre-designed data gathering instrument, called the audit tool, will be refined (Philpott & Voce, 2001: 68-76)			
Step 3: Pilot of the audit tool	Antenatal cards drawn according to inclusion criteria from one clinic in the Nelson Mandela Metropole	Ten research assistants and the researcher will audit the same 12 antenatal cards to assess validity and reliability	Analysis of variance (ANOVA)

<p>Step 4: A baseline of the quality of antenatal care in primary health care clinics will be determined</p>	<p>Ten clinics will be conveniently identified and divided into an experimental and a control group. Baseline data will be collected in both groups. One person per clinic will be trained as research assistant to complete the audit.</p> <p>Population: Antenatal cards of pregnant women attending antenatal care at primary health care clinics in the Nelson Mandela Bay Metropole.</p> <p>Sample: Conveniently selected antenatal cards from the ten identified clinics with inclusion criteria as pregnant women:</p> <ul style="list-style-type: none"> ◦ whose visit was completed ◦ with a gestation period of 36 weeks or more ◦ with an antenatal record ◦ who gave informed written consent to participate in the study (See annexure C) <p>Data collection for all clinics will start on the same date.</p> <p>Sample Size: 50 antenatal cards per clinic</p>	<p>Clinic supervisors of the ten selected clinics will be informed.</p> <p>Identified clinics will be visited by research assistants and a sample of pregnant women drawn.</p> <p>Pregnant women whose visit was completed will be approached by the research assistant for participation and written consent will be obtained. With the necessary consent obtained the antenatal card will be audited by the research assistant.</p>	<p>Statistical analysis of baseline data will be done using Student T-test and descriptive statistics. An independent statistician will analyse the data.</p>
<p>Step 5: Implement the BANC Package</p> <p>Implementation of the BANC package will be done through the Trainer of Trainees approach. Only professional nurses, selected as research assistants, from the five experimental clinics, will be trained. Five two hour training sessions is planned to complete the training for one trainer at each of the five experimental clinics. The trainers will then be tasked to train primary health care nurses at clinic level to implement the BANC package. The five clinics in the control group will have antenatal cards audited but the BANC package will not be implemented.</p>			

<p>Step 6: Retest One</p>	<p>The audit of antenatal cards will be repeated in the ten clinics conveniently identified and divided into an experimental and a control group, three months after intervention in the experimental group. Population and sampling will be the same as described for the baseline process.</p>	<p>Clinic supervisors of the ten selected clinics will be informed. Identified clinics will be visited and a sample of pregnant women drawn. After completion of the visit and with consent obtained the antenatal card will be audited by the research assistant.</p>	<p>Statistical analysis and comparison of baseline data and retest one data will be done using Student T-test and descriptive statistics. An independent statistician will analyse the data.</p>
<p>Step 7: Determining experiences of individuals involved in the training and implementation of the BANC package</p>	<p>Population: The population includes all the managers, trainers and trainees from the clinics where the BANC package will be implemented. Sampling: Purposive sampling will be used to select participants. Two groups will be selected in the sample. The trainers of trainees (research assistants trained by the master trainer) will be selected as one group to participate in the focus group discussion; The managers and clinic staff from the clinics where the BANC package was implemented, will be selected as the second group for individual interviews.</p>	<p>Focus group interviews will be done for the trainers of trainees by an independent facilitator. Questions: <ul style="list-style-type: none"> ○ <i>How did you experience your own training in the Basic Antenatal Care Package?</i> ○ <i>How did you experience training other people in the Basic Antenatal Care Package?</i> Individual interviews will be done with managers and clinic staff. Guiding question: <ul style="list-style-type: none"> ○ <i>How did you experience the training and implementation of the basic antenatal care package in your clinic?</i> The first individual interview will be used as the pilot study.</p>	<p>Data will be analysed according to the method of Tesch (cited in Creswell, 1994:155) by coding data and identifying themes and sub-themes for description. Literature control will be done to identify themes by searching for literature to compare, support or contrast findings (Creswell, 1994: 21). Guba's model (cited in Krefting, 1991:214-222) will be used to ensure trustworthiness. An independent coder will be approached to re-code the data.</p>

<p>Step 8: Retest Two</p>	<p>The audit of antenatal cards will be repeated in the ten clinics conveniently identified and divided into an experimental and a control group, six months after intervention in the experimental group. Population and sampling will be the same as described in the baseline process.</p>	<p>Clinic supervisors of the ten selected clinics will be informed. Identified clinics will be visited by research assistants and a sample of pregnant women drawn. Pregnant women whose visit was completed will be approached by the research assistant for participation and written consent will be obtained. With the necessary consent obtained the antenatal card will be audited by the research assistant.</p>	<p>Statistical analysis and comparison of baseline data, retest one and retest two data will be done using Student T-test and descriptive statistics to determine differences and effectiveness of the intervention. An independent statistician will analyse the data.</p>
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1.9.2. Phase 2: Develop recommendations and guidelines for the training and implementation of the BANC package

Objectives:

- To make recommendations for the implementation of the BANC package
- To develop guidelines for the training and implementation of the BANC package

Table 1.1. Research methodology: Planned phases and steps.

1.10. Ethical considerations

The conduct of nursing research requires not only expertise and diligence but also honesty and integrity (Burns & Grove, 2005:176). Conducting the research ethically starts with the identification of the study topic and continues through to the publication of the research report. Research ethics places an emphasis on the humane and sensitive treatment of research participants who may be placed at varying degrees of risk by research procedures (Bless, Higson-Smith & Kagee, 2006:140).

This research project involves information on clinic cards of pregnant women therefore certain ethical issues had to be considered. It also involves the trainers of trainees (acting as research assistants), managers and clinic staff. An independent facilitator conducted the interviews with some ethical issues related to the focus group discussion. The ethical issues considered included permission to conduct the study, consent from participants, prevention of harm to participants, anonymity and consent and communication of research results.

- Permission to conduct the study: Before the study can be conducted it was necessary to obtain approval from the Faculty of Health Research and Technological Inventions Committee of the Nelson Mandela Metropole University, the employer of the researcher, and the management authority of the respective clinics. The approval of the Faculty of Health Research and Technological Inventions Committee of the Nelson Mandela Metropole University (See Annexure A.1.) and the Ethics Committee (Human) of the Nelson Mandela Metropolitan University (See Annexure A.2.) was obtained before implementation of the study. Permission was obtained from the Provincial Department of Health, Epidemiology and Research Directorate (See Annexure B.1.), the Provincial District Manager for Health (See Annexure B.2.) and the Business Unit Manager: Health of the Nelson Mandela Bay Metropole Municipality (See Annexure B.3.).

- Informed consent: Consent will be obtained from participants following an explanation of the purpose of the study. Informed consent exists when the participants are told at the beginning what the risks are and are asked to give their consent to the procedure (Reaves, 1992:39-61). The process of audit will be explained to all patients and written consent will be obtained from each pregnant woman attending the clinic, before the card is audited. (Annexure C). Cards will only be audited after the consultation for the particular visit is completed. Should a patient not give consent, it will in no way affect her management and the card will not be included in the sample.
- Informed consent for interviews: For the interviews and focus group discussion informed consent will be obtained at the point where the interview is scheduled. The purpose of the interview and focus group discussion will be explained and voluntary participation will be emphasized. Should a participant wish to terminate the interview before completion, the researcher will honour the decision. At the start of the interview written consent for participation and recording the interview on audio tape will be obtained (Annexure D.3.).
- The prevention of physical and mental harm: The right to protect from discomfort and harm is based on the ethical principle of beneficence (Burns & Grove, 2005:190). The researcher must try and avoid exposing participants to any physical or mental harm. Whenever there is any substantial risk, it is important to make participants aware ahead of time. Should a gross omission or incorrect management of a pregnant woman be identified during the audit process, the professional nurse in charge of the clinic will be informed, to enable corrective steps to be taken immediately, and thus prevent harm to the patient.

Although adverse events are not foreseen for the individual and focus group interviews, the employee assistance programme manager will be approached to assist with debriefing, should it be required.

- Maintaining anonymity and confidentiality: Confidentiality exists when the person knows that the observer can identify his behaviour, but expects that the observer will not pass on the information to anyone else (Reaves, 1992:39-61). This principle can be violated in a variety of ways, and it is very important for researchers to safeguard the privacy and identity of participants, and to act with the necessary sensitivity where the privacy of subjects is relevant (Yegidis & Weinbach, 1996:34). Information given anonymously ensures the privacy of subjects. Anonymity means that no one, including the researcher, should be able to identify any subject afterwards (De Vos, et al. 2004:67). All data concerning pregnant women will remain confidential at all times and all data will be anonymised at point of collection. At the collection point, that is when the patient's card is audited, the patient's name will not be recorded on the score sheet, but only a number will be allocated to her to indicate the numerical count of patients. When the patient's antenatal card is given back to her it will not be possible to link the card with the number allocated on the score sheet. The clinic names will be replaced with a number when reporting on results.

The focus group interviews with the 'trainers of trainees' will be conducted by a facilitator to ensure that all participants can discuss issues freely. The data will be transcribed. Data collected will be anonymised at transcription of the audio tapes, the researcher will not be able to link data to a particular participant and data will not be reported linked to a clinic. The facilitator will be cautioned about the confidentiality of the information. The interview participants will be known to the researcher with the data anonymised at transcription, and clinic names or participant names will not be used in the research report.

- Communication of research results: On completion of the study the results will be compiled in a report and communicated to the relevant managers, as well as the Eastern Cape Department of Health, Epidemiology and Research Directorate. Reporting back to the pregnant women themselves will not be possible as they are not known to the researcher. However a request can be made to share results with the Nelson Mandela Bay Municipality clinic forum. Feedback to research assistants,

managers and clinic staff will be done through management meetings. Results will be presented at a relevant conference and published in journals.

The researcher could not compensate the research participants in any material way; however the implementation of the Basic antenatal care package aims to improve the quality of antenatal care received by pregnant women, which may hold benefit for the future users of the antenatal services in the Nelson Mandela Bay metropole. The trainers of trainees will receive training with an update of knowledge and skills in the care of pregnant women.

1.11. Brief outline of the research report

On completion of the research project the results need to be reported and communicated to the appropriate audience (Department of Health, 2001c:15). The research report serves as a document to communicate the process and results, and will include the following chapters:

- Chapter 1: Introduction
- Chapter 2: Literature review
- Chapter 3: Research methodology
- Chapter 4: Effect of the BANC Package on quality of antenatal care
- Chapter 5: Experiences of individuals involved in the implementation of the BANC package
- Chapter 6: Guidelines, Recommendations, Limitations and Conclusion

1.12. Conclusion

The research problem was formulated with reference to current literature available on antenatal care and the outcomes for women and their newborn babies. Research questions were stated and the research objectives formulated. The research design and planned methodology were briefly discussed. The knowledge and experience gained through completing the research project will be applied to make recommendations and develop

guidelines for the training and implementation of the BANC package. A literature review will be described in Chapter Two.

Chapter Two Literature Review

2.1 Introduction

The review of literature is aimed to contribute towards clearer understanding of the nature and meaning of the problem that has been identified (De Vos, et al. 2004:128). In quantitative research a review of relevant literature is conducted to generate a picture of what is known about a particular situation (Burns & Grove, 2005: 37). The literature review will cover aspects of antenatal and perinatal care focusing on quality of antenatal care services and the effect these services may have on the outcome of the pregnancy for the mother and her unborn baby. The new WHO model of care and the integrated approach to antenatal care is reviewed. To conclude the chapter a description of the BANC package is provided. The literature review for the qualitative section will follow the analysis of the focus group and individual interviews, to compare and support identified themes.

2.2. Antenatal Care

The provision of antenatal care during pregnancy through the public health services was a relatively late development in modern obstetrics. Not until the late 1930s did the United Kingdom of Great Britain and Northern Ireland authorities decide that all women should be offered regular check-ups during pregnancy as an integral part of maternity care, some 30 years after the introduction of formalized labour and delivery care (Abou-Zahr & Wardlaw, 2003:2). This development was stimulated by the realization that whereas maternal mortality due to puerperal sepsis, haemorrhage and obstructed labour had declined substantially during the early years of the 20th century, this was not the case for deaths associated with eclampsia. If these eclampsia related deaths were to be averted, it was supposed, interventions would be needed earlier during pregnancy, to measure blood

pressure, identify women at risk of eclamptic convulsions, and take measures to reduce blood pressure whenever possible (Abou-Zahr & Wardlaw, 2003:1).

During the second half of the 20th century, international awareness grew of the dimensions of the tragedy of maternal mortality; national governments collaborated with technical assistance and donor agencies to ensure that pregnant women in developing countries also had access to maternity care (Abou-Zahr & Wardlaw, 2003:1). Motherhood is a positive and fulfilling experience for most women; however, pregnancy and childbirth can also be associated with suffering, ill health or even death. Interventions that can prevent maternal and perinatal mortality from major causes are known and can be made available even in resource poor settings. So that all births are positive and fulfilling experiences, support in pregnancy and childbirth needs to focus on adequate preparation in the household, support to the woman and her baby, early detection and management of complications and ensuring that quality services are available and accessible to where women live (WHO, 2004a:4).

In recognition of the potential of care during the antenatal period to improve a range of health outcomes for women and children, the World Summit for Children in 1990 adopted antenatal care as a specific goal namely: “*Access by all pregnant women to prenatal care, trained attendants during childbirth and referral facilities for high-risk pregnancies and obstetric emergencies*” (Abou-Zahr & Wardlaw, 2003:2). Similar aims have been voiced in other major international conferences, including the International Conference on Population and Development in 1994, the Fourth World Conference on Women in 1995 (Abou-Zahr & Wardlaw, 2003:2), their five year follow-up evaluations of progress and the United Nations General Assembly Special Session on Children in 2002 (United Nations General Assembly, 2002:3).

In South Africa free services were introduced for pregnant women and children under five in the immediate post apartheid era to improve accessibility, yet in terms of maternal and perinatal outcomes, South Africa scores poorly compared to other upper-middle income countries (Ijumba, Ntuli & Baron, 2004: 90). The antenatal period clearly presents opportunities for reaching pregnant women with a number of interventions that

may be vital to their health and well-being of their infants. For example, if the antenatal period is used to inform the women and families of the danger signs and symptoms and about the risks of labour and delivery, it may provide the motivation for ensuring that pregnant women deliver with the assistance of a skilled attendant or at the health facility (Abou-Zahr & Wardlaw, 2003:2).

The antenatal period provides an opportunity to supply information on birth spacing, which is recognised as an important factor in infant survival. Better understanding of fetal growth and development, and its relationship to the mother's health has resulted in increased attention to the potential of antenatal care as an intervention to improve both maternal and newborn health. Tetanus immunisation can be life saving for both mother and infant. The prevention and treatment of malaria, management of anaemia and treatment of sexually transmitted diseases can significantly improve fetal outcomes and improve maternal health. Adverse outcomes like low birth weight can be reduced through interventions to improve the nutritional status and prevent infections of the mother during pregnancy. More recently the potential of the antenatal period as entry point for HIV preventions and care, in particular the prevention of HIV transmission from mother to child, has led to renewed interest in access to, and use of antenatal care services (Abou-Zahr & Wardlaw, 2003:2). Good care during pregnancy is important for the health of the mother and the development of the unborn baby (Lincetto, Mothebesoane-Anoh, Gomez & Munjanja, 2006:51).

Non-pregnancy related infections are the commonest cause of maternal mortality in South Africa since 1999 with HIV/AIDS being the major contributor to these deaths (Pattinson, 2002:136). The Third Saving Mothers Report 2002-2004 (Pattinson, 2006:160) affirms non-pregnancy related infections as the leading cause of maternal deaths with AIDS deaths being the biggest challenge for the health sector. Counselling and voluntary HIV testing especially if performed early in pregnancy offers benefits for HIV positive women, and their sex partners. It permits them to make informed decisions regarding sexual activity, contraception, termination of pregnancy and methods of infant feeding. Improvement of the quality of life for HIV/AIDS patients as well as the prolongation of life can be achieved through recognition of opportunistic infections, providing therapy for

acute and chronic complications, providing prophylaxis for some of the opportunistic infections, and providing ARV in women with AIDS (Department of Health, 2004:1).

In South Africa the antenatal care programme is the responsibility of the Women's Health and Genetics Directorate (Beksinska et al., 2006:305). A number of guidelines have been produced which deal with management of pregnant women including what services should be provided at each level of care and referral systems required. The extensive HIV epidemic in South Africa has led to rapid roll out of programmes that have implications for antenatal care. These programmes VCT, PMTCT and ARV had been implemented vertically and is not well integrated into existing services. The provision of an integrated and comprehensive antenatal care package of services poses a number of challenges in a fragmented and vertical health care system (Beksinska, Kunene & Mullick, 2006:305).

2.2.1. Components and principles of care during the antenatal period

Most antenatal care programmes in developing countries were established along the lines of those in developed countries, with little adjustment for local conditions. In recent years much of what is carried out under the heading of antenatal care has been questioned. It has emerged that few of the components of standard antenatal care regimens have been subjected to rigorous scientific evaluation to determine their effectiveness (Abou-Zahr & Wardlaw, 2003:2).

In 2001, the World Health Organisation (WHO) published the conclusions of a randomised trial of a new model of antenatal care and also carried out a systematic review of other randomised trials that looked at the effectiveness of different models of antenatal care. This work has led to a growing consensus around key elements of antenatal care that are likely to improve maternal and/or perinatal health outcomes (Villar & Bergsjø, 2002:1-45). A detailed description of this model is provided in section 2.5 of this chapter.

The WHO Regional Office for Europe convened a workshop at which it was proposed that ten principles should underline perinatal care in the future (WHO, 2004a:27-28). At this 3rd task force meeting the tenth principle namely '*Care should respect a woman's dignity, autonomy and privacy*' was adopted and is known as the Verona principle (WHO, 2004a:29). The ten principles are listed in Chapter one.

In developing standards and a framework for antenatal care for South African conditions, Van der Westhuizen (1999:114-116) describes the following criteria for quality antenatal care:

- Antenatal care should be available to all pregnant women
- Antenatal care should be effective using available resources optimally
- Antenatal care should be acceptable to pregnant women, their families, the community and the health service management
- Antenatal care should be safe
- Antenatal care should be equitable
- Antenatal care should be reachable and accessible to all pregnant women
- Adequate resources should be available to provide antenatal care
- Antenatal care should be appropriate
- Antenatal care should be affordable and cost-effective
- Antenatal care should be comprehensive (Van der Westhuizen, 1999:114-116)

In the Perinatal Education Programme Theron (undated:7-13) provided the following principles as reflecting quality of antenatal care:

- Identification of women with special health conditions and/or those at risk of developing complications using a simple checklist
- Those women with special health conditions or risk factors should be referred to higher levels of care. Care must be taken to ensure identification of all women with special health conditions or risk factors
- Timing the visits such that the maximum benefit can be obtained, without wasting human resources

- Performing only examinations and tests that have been proven to be beneficial, at the most appropriate time
- Wherever possible rapid, easy to perform tests should be used at the antenatal clinic or in a facility close to the clinic. The results should be available the same day so that treatment can be initiated without delay
- Health care providers should make all the pregnant women feel welcome at their clinics. It should be convenient for the pregnant woman to attend. This implies that the opening hours of the clinic should be as convenient as possible to enable women to attend the clinic (Theron, undated:7-13).

The National Guidelines for Maternity Care in South Africa (Department of Health, 2002:18) contain the principles of antenatal care in the objectives. It is stated that antenatal care should ensure by antenatal preparation the best possible outcome for women and their babies. These objectives are listed in Chapter one.

More recently the Department of Making Pregnancy Safer (WHO, 2006b:1) developed and published standards for maternal and neonatal care as part of the WHO Integrated Management of Pregnancy and Childbirth Care (IMPAC) package. In the standard on provision of effective antenatal care the essential elements of care in pregnancy are as follows:

- Pregnancy surveillance of the woman and her unborn child
- Preventive measures, including immunization (especially with tetanus toxoid) and screening for underlying conditions and diseases such as anaemia, malaria, sexually transmitted infections (of which syphilis is particularly important owing to its negative impact on maternal and neonatal health and the links to a high incidence of stillbirth and low birth weight), HIV infection, and underlying mental health problems and/or symptoms of stress or domestic violence.
- Recognition and management of pregnancy-related complications.
- Recognition and treatment of underlying or concurrent illness or disease.
- Advice and support to the woman and her family in developing a birth and emergency preparedness plan.

- Health education and promotion for the woman and her family:
 - to increase awareness of maternal and neonatal health needs and self-care during pregnancy and the postnatal period, including the need for social support during and after pregnancy;
 - to increase health in the home, including healthy lifestyles, healthy diet, health and safety/injury prevention, and support and care in the home (including adherence to advice on prophylactic treatments such as iron supplementation, and use of insecticide-treated bed nets);
 - to support care-seeking behaviour, including recognition of danger signs for the woman and the newborn;
 - to promote postpartum family planning/birth spacing; and
 - to prepare emotionally and physically the pregnant woman and her partner and, where required, supporters for birth (WHO, 2006b:3).

Preventing problems for mothers and babies depends on an operational continuum of care with accessible, high quality care before and during pregnancy.

2.2.2. Access to antenatal care services

Most governments have ratified an international agreement, the Convention on the Elimination of All Forms of Discrimination against Women, which includes a legally binding commitment to provide the services pregnant women need (UNICEF, 2002:9). Efforts to monitor progress in coverage of antenatal care have generally focused on quantifiable issues, such as the number and timing of visits and the characteristics of users and non-users of antenatal care. The World Summit for Children (UNICEF, 2002:10) calls for ‘*access*’ to antenatal care, but access is a multidimensional concept that is very difficult to monitor. Most commentators recognise at least five different components of access, namely physical availability of service, distance and/or time to a facility, economic and other costs associated with use of the services, cultural and social factors that may impede access, and quality of services offered. Even if it were possible to reach consensus around the precise meaning and importance of these elements, their measurement would still remain problematic, particularly for drawing valid comparisons

between countries or regions. And access in itself says nothing about actual use of services. In practice, indicators for use are easier to define, measure and interpret than indicators for access. Data on use of antenatal care are available from household surveys (Abou-Zahr & Wardlaw, 2003:3).

Indicators on use of antenatal care services provide no information on the content or quality of the services. Despite the broad consensus on what the content and quality should be, it is generally recognised that the antenatal services currently provided in many parts of the world fail to meet the standards recommended by WHO. Some information on the content is available through Demographic and Health Surveys (DHS) which included questions about antenatal interventions such as height and weight checking, blood pressure testing and blood and urine testing. For the most part, however, the available data do not report on specific interventions or the quality of care (Abou-Zahr & Wardlaw, 2003:3).

Access or usage of antenatal care services in South Africa is monitored by the indicator *Antenatal coverage*. The South African Health Review refers to the indicator *Antenatal care coverage* as the proportion of women receiving some antenatal care with the data source as the District Health Information System. Antenatal coverage is estimated from the number of first antenatal visits divided by the population under one year as a proxy for the number of pregnant women. A further indicator the *Antenatal visits per client* is estimated from the total number of antenatal care visits divided by the number of first antenatal care visits (Ijumba, et al. 2004:62).

Most women have some antenatal care. Data for the late 1990's and for 2000-2001 show that just over 70% of women worldwide have at least one antenatal visit with a skilled provider during pregnancy. In the industrialised countries coverage is extremely high, with 98% of women having at least one visit. In the developing world antenatal care use is around 68%. The region of the world with the lowest levels of use is South Asia, where only 54% of pregnant women have at least one visit. In the Middle East and North Africa, use of antenatal care is somewhat higher at 65% of pregnant women. In Sub-Saharan Africa, generally the region with the lowest levels of healthcare use, fully 68% of women

report at least one visit (Abou-Zahr & Wardlaw, 2003:5). In South Africa 94% of pregnant women have at least one visit (Ijumba, et al. 2004:62). For South Africa, according to the 1998 South African Demographic and Health Survey (Ijumba, et al. 2002: 63) only 3% of births were to mothers who received no antenatal care. Nearly three-quarters (73.1%) of births were to women who had attended four or more antenatal visits and the median number of antenatal visits was 5.3 (Ijumba, et al. 2004: 63). Women who were less educated and women with more babies were less likely to attend antenatal care services (Abou-Zahr & Wardlaw, 2003:13). The South African Demographic and Health Survey (Ijumba, et al. 2004:64) reported that the median number of months pregnant at first visit was 5.2 and more than a quarter (28.1%) of women started to attend antenatal care when they were six or seven months pregnant. Overall there appears to be a consistent link between use of antenatal care and delivery by a professional health care provider. Women reporting four or more antenatal visits are far more likely to have given birth with professional assistance than women with fewer visits (Abou-Zahr & Wardlaw, 2003:13).

While these figures do not tell us anything about the quality of care on offer, it is clear that women are able and willing to present for antenatal care, thus providing opportunities to give them information and services that can help improve their health and the health of their infants.

2.2.3. Skilled care during the antenatal period

Already in 1999, a joint statement by WHO, UNFPA (United Nations Population Fund), UNICEF (United Nations Children's Fund) and the World Bank, called on countries to ensure that all women and newborns have skilled care during pregnancy, childbirth and the immediate postnatal period (WHO, 2004b:1-6). Skilled care refers to the care provided to a woman and her newborn during pregnancy, childbirth and immediately after birth by an accredited and competent health care provider who has at her disposal the necessary equipment and the support of a functioning health system. Thus a skilled attendant is an accredited health professional, such as a midwife, doctor or nurse, who has been educated and trained to proficiency in the skills needed to manage normal

(uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns (WHO, 2004b:5).

The successful provision of the continuum of care requires a functioning health care system with the necessary systems and infrastructure in place, including transport between the primary level of health care and referral clinics and hospitals. It also needs effective, efficient and proactive collaboration between all those involved in the provision of care to pregnant women and newborns. The skilled attendant is at the centre of the continuum of care. At the primary health care level, she/he will need to work with other care providers in the community, such as traditional birth attendants and social workers. She/he will also need strong working links with health care providers at the secondary and tertiary levels of the health system. Care during pregnancy, labour and birth is based on the principle that pregnancy is a normal physiological process in a woman's life and the skilled attendant is to facilitate, guide and support this process (WHO, 2004a:12) using evidence based guidelines.

2.2.4. Content of antenatal care

Pregnancy is not just a matter of waiting to give birth. In the World Health Report 2005 (WHO, 2005:41) the three most important components of care during pregnancy are stated as first, providing good antenatal care, second, avoiding or coping with unwanted pregnancies, and third, building societies that support women who are pregnant. Good antenatal care does more than just deal with the complications of pregnancy (WHO, 2005b:46). Women are the largest group of health care users actively and willingly seeking care at clinics. This offers enormous opportunities to use antenatal care as a platform for programmes that tackle nutrition, HIV/AIDS, malaria and tuberculosis. These important opportunities during antenatal care should not be missed. Antenatal consultations offer an opportunity to promote healthy lifestyles that improve long-term outcomes for the woman, her unborn child and possibly the family. Antenatal care also provides an opportunity to establish a birth plan. Antenatal care consultation provides an opportunity to prepare mothers for parenting and for what happens after birth.

The content includes assessment, including a well-taken history, physical examination and laboratory tests; and health promotion. Antenatal care is the opportunity to talk to women, build relationships and reinforce maternal health messages for example on nutritional advice, rest, discomforts of pregnancy, hygiene, safer sex, planning for place of birth, newborn care, contraception, lifestyle etc. Lastly care provision for diagnosed conditions should be included in antenatal care (WHO, 2005:46).

Abou-Zahr & Wardlaw (2003:24-25) reported on Demographic Health Surveys in 14 countries analysing the content of antenatal care. Questions about common elements of antenatal care were asked. Women were asked whether and what specific data were collected, including taking of weight and height, measurement of blood pressure, and taking blood or urine samples. Women were also asked whether they received information about danger signs for pregnancy complications and what to do if these arose. With analysis of the limited data the most common elements of antenatal care reported by women were found to be measurement of height and weight and blood pressure, and the least common elements were found to be blood and urine tests along with health information on danger signs (Abou-Zahr & Wardlaw, 2003:24).

2.3. Quality of Antenatal Care Services

In the Health for All strategy (WHO, 2005a:11-16) the WHO stated the three values which underwrite quality of care namely equity, solidarity and participation. The benefits of quality improvement include better health, improved relations between the general public and health professionals, and a decrease in costly failures in patient management. These principles are reflected in the Millennium Development Goals in particular Goal 4 and 5 related to the reduction of child and maternal mortality respectively (Thieren & Beusenbergh, 2005:17-19).

The strategic priorities of the National Department of Health 2004-2009 (Department of Health, Undated:4) are introduced with the vision statement as '*An accessible, caring and high quality health system*'. The mission statement developed from this vision is '*To*

improve health status through prevention and promotion of healthy lifestyles and to consistently improve the health care delivery system by focusing on access, equity, efficiency, quality and sustainability'. Although progress is reported (Department of Health, Undated:6-7) on improving quality of care, it is noted by Beksinska, Kunene & Mullick (2006:297) that although antenatal care attendance is high, the services rendered such as timing of the first visit and providers' attitudes need to be critically assessed as they are also important if optimum quality of care is to be achieved. Staff shortages, training and staff motivation appear to be particular issues in maternal health care services. The introduction of the prevention of mother-to-child transmission of the HIV programme and more recently the recommendation that women should be initiated into the antiretroviral programme during antenatal care have placed additional challenges on the maternal health services (Beksinska et al.,2006:297).

Quality assessment is a process of measuring quality of care. It consists of numerous approaches which define quality of care, select indicators for measurement, collect data, analyse, and interpret results. Quality assessment is considered a first step in quality assurance. Quality assurance is a conscious effort to change or improve the level of care based upon measures of quality. Quality improvement allows for a cyclical improvement over time, including all quality assurance processes. Assessing and measuring quality of clinical care in a way that enables it to be quantified is an essential ingredient for quality improvement (Wilson, 1998:163-170). Quality improvement requires considerable management dexterity to motivate staff who may be weary of yet another bright idea or who may consider that the quality of what they offer is their own business, or that existing standards are being jeopardized by the need to balance the books (Smith, 1992:207). The author refers back to Frederick Taylor who in the early 20th century advocated that efficiency could best be achieved through the separation of planning and design from implementation for delivery, with managers taking sole responsibility for the former, and workers for the latter. Product quality was achieved by managers measuring and checking workers' output at each stage of production. The far-reaching implications of this splitting of tasks led to the achievement of Taylor's often quoted phrase to workers *"You are not supposed to think – there are other people paid for doing that around here"* (Smith, 1992:208). Industrial history shows that, throughout the 1940s and 1950s, many

workers did indeed stop thinking about how to do the job well and instead put their energies into disrupting, or simply not attending to, their automated, mindless work (Smith, 1992:209). Industry responded by embracing what is now known as continuous quality improvement. Essentially the heart of this approach is to understand that poor quality arises from deficient systems or processes, not from bad staff – most people want to do a good job, if given the right structure. Rather than blame individuals, we have to ask “*What is wrong with the process that allows this to happen?*”. Even when people were at the root of defects, the problem was generally not one of motivation or effort, but rather of poor job design, failure of leadership, or unclear purpose (Smith, 1992:207).

From the early 1970’s the debate on health care quality has been influenced by Avedis Donabedian’s writings which view quality of medical care in terms of **structure**, **process**, and **outcome** (Larson & Muller, 2002:265). Structure refers to the setting in which the process of care takes place and the instrumentalities of which it is the product. This includes the qualifications of medical staff, organisational structure, financial policies and the operation of programmes (Larson & Muller, 2002:265). The **structure** is controlled by managers and the health system. It is crucial for the structure to be in place before staff can be expected to provide a quality service to the community. The basic structure for service delivery needs to be in place before quality improvement programmes can be effective. In examining **process** one is interested not in the power of medical technology to achieve results, but in whether what is now known to be ‘good’ medical care has been applied (Larson & Muller, 2002:265). Process measures emphasize the technical management of illness but also include rehabilitation, prevention, continuity of care, and aspects of patient – physician interaction. Today process measures are often measured against national standards (Larson & Muller, 2002:265). Process measures assess whether evidenced based practice is applied. Finally, **outcome** of care is defined in terms of recovery, restoration of function and of survival. Outcomes are measured in a variety of ways but generally fall into two categories: generic and disease specific measures. Generic measures are broad, multivariable assessments of the patient’s physical and mental health whereas disease specific outcome measures results from specific treatments (Larson & Muller, 2002:266). Donabedian’s three components of medical care imply certain relationships among the three conceptual domains. Simply

stated, appropriate structure and process will lead to favourable medical outcomes. Rather one should see structure and process as precursors to improved outcomes, as good results are dependant on a number of other factors that are not under the control of the health practitioner (Larson & Muller, 2002:267).

The maternal and perinatal mortality as indicators of quality were discussed in Chapter one. Systems in place to monitor these deaths in South Africa are the National Committee on Confidential Enquiries into Maternal deaths (Pattinson, 1999:1-164), the Perinatal Problem Identification Programme (Pattinson, 2004:1-137) and the District Health Information System. While a relatively high rate of antenatal attendance for example 98% in 2004 for the Eastern Cape, was reflected, there needs to be further critical analysis of the services themselves (Beksinska et al., 2006:300). Services rendered during antenatal care are important if optimum quality of care is to be achieved. High quality of care must be assured in whatever environment antenatal care takes place. Quality of care is important as:

- Good quality of care are cost-efficient: by meeting women's health needs without delay, health systems avoid having to provide more intensive (or expensive) care at a later stage
- Good quality of services are equitable: health systems have an obligation to provide the highest possible quality of care within the parameters of the existing resources to all who need them
- Good quality services are effective: when qualified staff is working with adequate resources, they are able to manage health problems more effectively, reducing fatalities. In addition, when services are appreciated and valued by community members, they are more likely to be used on timely basis
- Good quality services improves staff morale: Health workers are likely to have more positive attitudes toward their work and to perform better when they receive the support and resources they need to provide essential services, and when their work is valued by the community.
- Good quality services saves women's lives (Family Care International, 1998:1).

The quality of services rendered during antenatal care may be audited by reviewing the antenatal card which is the principal record of the pregnancy and should be completed at each antenatal visit and retained by the mother until delivery (Department of Health, 2002:18). A system was developed to measure the quality of antenatal care by auditing antenatal cards (Philpott & Voce, 2001: 68-76). The audit tool is discussed in Chapter Three.

2.4. Effect of antenatal care on the pregnant women and her unborn baby

Good care during pregnancy is important for the health of the mother and the development of the unborn baby. Pregnancy is a crucial time to promote healthy behaviours and parenting skills. Inadequate care during this time breaks a crucial link in the continuum of care, and affect both women and babies (Lincetto, Mothebesoane-Anoh, Gomez & Munjanja, 2006:52).

2.4.1. Effect on the Mother

It has been estimated that 25% of maternal deaths occur during pregnancy, with variability between countries depending on the prevalence of unsafe abortion, violence, and disease in the area (Lincetto et al., 2006:52). Between a third and a half of maternal deaths are due to causes such as hypertension (pre-eclampsia and eclampsia) and antepartum haemorrhage, which are directly related to inadequate care during pregnancy. Certain pre-existing conditions become more severe during pregnancy. Malaria, HIV/AIDS, anaemia and malnutrition are associated with increased maternal and newborn complications as well as death. AIDS remain the main cause of maternal death with delay in providing care as a factor in the management of many women (Pattinson, 2006:160). Access to counselling and voluntary testing with availability of anti retroviral therapy and nutrition support may impact on the outcome for both the mother and the baby. Intervention during antenatal care which may impact on the health of the mother and the outcome of the pregnancy is summarised in table 2.1 below (Pattinson, undated:9).

Problem	Prevention	Screen/diagnose	Treatment
Mother			
Anaemia	Iron and folate prophylaxis	Check haemoglobin	Iron and folate or iron injections or blood transfusion
Hypertension/pre-eclampsia	Calcium supplementation	Check blood pressure, urine	Treat hypertension
Syphilis	As for STIs	RPR, VDRL	Bicillin
Vaginitis	As for STIs	Syndromic approach	Erythromycin and metronidazole
Urinary tract infection	Personal hygiene	Urine dipsticks or urine culture	Ampicillin
HIV	As for STIs	Counselling and voluntary testing	Antiretroviral therapy for mother, PMTCT for fetus/neonate Multivitamin supplementation
Tuberculosis	TB prophylaxis where indicated	Chest X ray, sputum culture	Anti TB drugs
Malaria	Prophylaxis	Symptomatic treatment	Anti malarial drugs
Pre-existing medical conditions, Diabetes, heart disease, epilepsy		History and examination	Refer
Gestational diabetes mellitus		Family history, previous baby's birth weights, Glucosuria	Investigate, Treat as necessary or refer
Malnutrition	Balanced protein/calorie supplementation, multivitamin supplementation	History, clinical examination (Body/mass index)	Refer social workers, Food supplementation

Table 2.1: Effective interventions during the antenatal period for maternal health (Pattinson, 2005:9)

2.4.2. Effect on the unborn baby

More than one in five deaths among children under five occurs during the first week of life, most due to malnutrition in the mother and fetus leading to low birth weights, and compounded by poor antenatal care and lack of skilled birth attendance (Thieren & Beusenberg, 2005:16). Antenatal care improves the survival and health of babies directly by reducing stillbirths and indirectly by providing an entry point for health contacts at a key point in the continuum of care (Lincetto et al., 2006:53) for the pregnant woman. Effective antenatal care may impact on the causes of unexplained stillbirths, cited as the most common recorded category of perinatal death and described in the Saving Babies

Report 2003 (Pattinson, 2004:10). The most likely causes of these deaths are intrauterine growth restriction (IUGR), post-maturity, congenital abnormalities and uro-genital infections in the mother. These causes were further analysed and are discussed in more detail below.

2.4.2.1. Intra-uterine growth restriction and post maturity

Intra-uterine growth restriction and post maturity are discussed together as both depend on the accurate determination of gestational age as a precondition for its diagnosis. One of the prime aspects of antenatal care is to determine the expected date of delivery accurately. The best time to establish the expected date of delivery is at the first meeting with the patient. Establishing the last normal menstrual period and hence gestational age is very important. The clinical examination of the size of the uterus if done early in pregnancy, and if the size coincides with the estimated gestational age, is the easiest method of accurately determining estimated date of delivery. Knowing the accurate expected date of delivery allows for determining if a patient is post-dates (post maturity) and for estimating if the fetus is growing as expected *in-utero* (intra uterine growth restriction). The first meeting of a pregnant woman with the health services is usually at the time of confirmation of the pregnancy. In the majority of cases, this occurs within three months of missing a period, giving a wonderful opportunity to establish accurate gestational age, without any special investigations such as sonar (Pattinson, 2004:99).

In the Third Saving Babies Report 2003 (Pattinson, 2004:89) intrauterine growth restriction (IUGR) is defined as a fetus not reaching its full genetic potential. Inadequate supply of nutrients is the most common cause, with infections in the mother also contributing. In this report it is concluded that IUGR is under diagnosed and that the majority of these deaths can be prevented if diagnosed (Pattinson, 2004:89). Post maturity refers to a fetus that remains in utero longer than the normal gestational period, that is longer than 42 weeks in humans, which puts the baby at risk, because of inadequate placental function (Stedmans' Medical Dictionary, 2005:1172). It is essential that more attention be focused on establishing the gestational age and monitoring the

growth of the fetus appropriately so that growth restriction and post-maturity can be diagnosed (Pattinson, 2004:86-92).

IUGR may present as an infant with low birth weight. Low birth weight has been defined by the WHO as weight at birth of less than 2,500 grams. This is based on epidemiological observations that infants weighing less than 2,500g are approximately 20 times more likely to die than heavier babies. More common in developing than developed countries, a birth weight below 2,500g contributes to a range of poor health outcomes. The reduction of low birth weight forms an important contribution to the Millennium Development Goal (MDG) for reducing child mortality. Activities towards the achievement of the MDGs will need to ensure a healthy start in life for children by making certain that women commence pregnancy healthy and well nourished, and go through pregnancy and childbirth safely (UNICEF. 2004:P4). A baby's low weight at birth is either the result of preterm birth (before 37 weeks of gestation) or due to intrauterine growth restriction. Low birth weight is closely associated with fetal and neonatal mortality and morbidity, inhibited growth and cognitive development, and chronic diseases later in life. Many factors affect the duration of gestation and fetal growth, and thus, the birth weight. They relate to the infant, the mother, or the physical environment and play an important role in determining the birth weight and the future health of the infant (UNICEF. 2004:4).

2.4.2.2. Infections

Maternal infections can cause perinatal deaths directly by transmitting the infection to the fetus (as in the case of syphilis) and indirectly by creating maternal complications that result in a preterm labour or placental insufficiency, ultimately causing fetal or neonatal complications and death. Blood born infections such as syphilis, HIV, rubella, cytomegalovirus, toxoplasmosis, malaria and tuberculosis can cross the placenta and infect the fetus directly. The only protection against this is the maternal immune system, the placental barrier and the fetal immune system. Congenital infections due to malaria and tuberculosis are being diagnosed more often now in immuno-compromised pregnant women infected with HIV. It is concluded that infections are underestimated as primary

causes of perinatal death because the methods of detection are limited and treatment options unclear (Pattinson, 2004: 79-85). Recommendations include encouraging early attendance at antenatal care, early reporting of complications like ruptured membranes, on-site routine syphilis screening and treatment, and training for clinicians to recognize amniotic fluid infection syndrome. The concern is raised that syphilis screening is not performed in 40% of unexplained stillbirths.

2.4.2.3. Congenital conditions

The Third Saving Babies Report 2003 (Pattinson, 2004: 69-77) concluded in the chapter on congenital abnormalities that there was considerable under-reporting of congenital abnormalities. Neural tube defects were the commonest congenital abnormality reported. Many opportunities for intervention are being lost by the lack of diagnosis of congenital abnormalities at birth or during the antenatal period. Recommendations include that folic acid should be given to all pregnant women, preferably in the three months before conception and throughout the first trimester. Women who have had congenitally abnormal babies previously should be offered specific counselling and testing, and women over 35 years should be offered screening for chromosomal abnormalities.

Interventions during the antenatal period which may impact on the health of the baby are summarised in table 2.2 below (Pattinson, 2005:10-11).

Problem	Prevention	Screen/diagnose	Treatment
Fetus			
Poor fetal growth	Balanced protein/calorie supplementation, Advice on smoking	Uterine growth (serial symphysis-fundus measurements)	Timely delivery
Post-maturity	Accurate gestational age	Calculate gestational age	Induce labour at 41 weeks gestation
Multiple pregnancies	Careful assisted reproduction	Uterine growth, Sonar	Refer for medical intervention
Breech presentation		Uterine palpation	External cephalic version/ Caesarean section
Congenital abnormalities	Peri-conception folic acid supplementation, Advice on alcohol consumption	Maternal age, previous history, Uterine growth, Sonar abnormalities	Refer to specialists
Rhesus isoimmunisation	Anti -D prophylaxis for Rh negative women in previous pregnancy	Rapid Rh, Coombs test for Rh negative women	Refer Rhesus negative women with anti-D antibodies
Neonatal tetanus	Tetanus Toxoid immunisation for the mother		

Table 2.2: Effective interventions during the antenatal period for fetal health (Pattinson, 2005:10).

All pregnant women should have at least four antenatal assessments by a skilled attendant. These should, as a minimum, include all the interventions outlined in the new WHO antenatal care model and be spaced at regular intervals throughout pregnancy, commencing as early as possible in the first trimester (WHO, 2006b:1). The new WHO model of antenatal care will be described in the following section.

2.5. The New WHO antenatal care model

The consequences of failing to provide good maternal and perinatal care can be seen in the disturbing statistics of maternal and neonatal morbidity and mortality for developing countries. Traditionally, antenatal care programmes have been recommended for developing countries along the lines of those used in developed countries, with only minor adjustments for local conditions. Many of the components of these antenatal

programmes have not been subjected to rigorous scientific evaluation to determine their effectiveness (Villar & Bergsjø, 2002: 5).

To address this paucity of information, the UNDP/UNFPA/WHO/World Bank Special Programme for Research, Development and Research Training in Human Reproduction implemented a multicentre randomized controlled trial that compared the standard 'Western' model of antenatal care with a new WHO model that limits the number of visits to the clinic and restricts the tests, clinical procedures and follow-up actions to those that have been shown to improve outcomes for women and newborns (Villar & Bergsjø, 2002:7).

Fifty-three antenatal care clinics (in Rosario, Argentina; Havana, Cuba; Jeddah, Saudi Arabia; and in the province of Khon Kaen, Thailand) were randomly assigned to provide either the new WHO model or the standard model currently in use. Twenty-seven clinics provided the new WHO model and 26 clinics provided the standard model. In total, 24 678 women were enrolled over an 18-month period between 1996 and 1998. Women enrolled in the new WHO model were classified on the basis of their obstetric and clinical histories. Those who did not require special treatment or assessment were offered the basic component of the new WHO model, while those deemed at higher risk were given the usual care for their condition (Villar & Bergsjø, 2002:9).

In the standard model currently in use, women made visits to the clinics once a month for the first six months of pregnancy, once every 2–3 weeks for the next two months, and then once a week until delivery. In this scenario, a woman would have about 12 visits to the clinic during her pregnancy. In the standard model women were routinely screened with urinary tests for proteinuria and infections, and with blood tests for syphilis, haemoglobin measurements and blood-group typing (Villar & Bergsjø, 2002:9).

In the new WHO model of antenatal care pregnant women are separated into two groups: those likely to need only routine antenatal care (some 75% of the total population of pregnant women), and those with specific health conditions or risk factors that necessitate special care (25% of pregnant women). For the first group, a standard programme of four

antenatal visits is recommended (with additional visits should conditions emerge which require special care). The WHO guidelines are also specific as regards the timing and content of antenatal care visits according to gestational age. Women are encouraged to attend early between 12 and 20 weeks gestation for the first visit, and thereafter at six weekly intervals at 26, 32 and 38 weeks gestation. The guidelines stipulate that only examinations and tests that serve an immediate purpose and that have been proven to be beneficial should be performed (Villar & Bergsjø, 2002:4).

The Guidelines for Maternity Care in South Africa (Department of Health, 2002:26) provides a schedule for return visits in low risk women presented in table 4.3, which could result in a total of 7 visits.

Gestational age at current visit	Scheduled return visit
5-19	24 weeks
20-23	28 weeks
24-28	32 weeks
29-36	After 4 weeks
37-38	After 2 weeks
39-40	41 weeks
41	42 weeks

Table 2.3: Department of Health schedule for return antenatal visits in low risk women.

A systematic review of randomized controlled trials that evaluated the effectiveness of different models of antenatal care was conducted by WHO in 2001 (Villar & Bergsjø, 2002:12). This review sought to test the hypothesis that an antenatal care model with a reduced number of visits, with or without goal-oriented clinical tests and interventions, was as effective as the standard model in terms of clinical outcomes, perceived satisfaction and costs. For women, the outcomes selected for comparison were pre-eclampsia, urinary-tract infection, postpartum anaemia and maternal mortality. Low birth weight and perinatal mortality were chosen as fetal and neonatal outcomes. Measures of women's satisfaction with care and cost-effectiveness were also considered (Villar & Bergsjø, 2002:12).

At the outset, the new WHO antenatal care model segregates pregnant women into two groups: those eligible to receive routine antenatal care, called the basic component; and those who need special care based on their specific health conditions or risk factors. Pre-set criteria are used to determine the eligibility of women for the basic component. The women selected to follow the basic component are considered not to require any further assessment or special care at the time of the first visit regardless of the gestational age at which they start the programme. The remaining women are given care corresponding to their detected condition or risk factor. Clinics will require some sort of risk-scoring form to assist their attempts to identify pregnant women at risk of complications in pregnancy or childbirth (Villar & Bergsjø, 2002:13).

The results of the WHO antenatal care randomized trial and the systematic review of the scientific evidence on models of antenatal care utilizing a reduced number of visits, justifies the introduction of the new WHO model for general use. The new WHO model of antenatal care is not associated with increased risk for either women or infants. Additionally, it reduces the time and resources necessary for antenatal care by limiting the number of visits, clinical procedures and follow-up actions to those that have been proven to be effective in promoting positive maternal and neonatal outcomes. It has been shown that the new WHO model is generally accepted by users and providers, does not increase cost, and in some settings decreases the costs associated with antenatal care services. Although providers are unlikely to achieve actual cost savings, resources such as staff and buildings, and the time of women and families, will be freed for extension of the service into more effective care provision or other activities. In developing countries, the goal should be to extend antenatal coverage to all pregnant women using the model outlined in this manual. Certainly, all activities of the basic component should be available, including referral to specialized care for women with complications or emergencies. The new WHO model should also be supplemented with specific interventions such as malaria control programmes; mother-to-child transmission of HIV prevention programmes; and ARV for AIDS patients, where needed (Villar & Bergsjø, 2002:37).

2.6. Integrated approach to antenatal care

The randomised control trial of the new WHO antenatal care model, discussed in the previous section, indicates issues of antenatal care which need to be addressed to improve the quality of care and the outcomes for pregnant women and their newborns. The Department of Reproductive Health and Research, Family and Community Health of the World Health Organisation developed a package of care known as the Integrated Management of Pregnancy and Childbirth, Pregnancy, Childbirth, Postpartum and Newborn Care (IMPAC): A guide for essential practice (WHO, 2003:A1-F6). This Guide is a tool for clinical decision-making, presented as coloured flow charts which details the information needed to assess and manage the pregnant woman. The flow charts are based on a syndromic approach whereby the skilled attendant identifies a limited number of key clinical signs and symptoms, enabling her/him to classify the condition according to severity and give appropriate treatment. Severity of the condition is marked in color: red for emergencies, yellow for less urgent conditions which nevertheless need attention, and green for normal care. The flow charts include information for each clinical condition or subject which need attention for example pre-eclampsia. The information is organized as follows on the flowchart for the example pre-eclampsia:

- * Key question to be asked (Severe headache, blurred vision, epigastric pain)
- * Important observations and examinations to be made (Blood pressure and proteinuria)
- * Possible findings based on the information elicited from questions, observations and measurements (Diastolic blood pressure 90-100mmHg on two readings and 2+proteinuria)
- * Classification of the finding (Pre-eclampsia)
- * Treatment and advice related to the signs and classification (Refer to hospital; Revise the birthplan)

Recommendations in the guide are generic. The guide should be adapted to national and local situations, not only within the context of existing health priorities and resources, but also within the context of respect and sensitivity to the needs of women, newborns and the communities to which they belong. The programme is designed specifically for those

primary health care clinics performing basic antenatal care, but can be used by any antenatal clinic providing more advanced care to ensure each pregnant woman has the basic care also included. The package focused on ensuring that interventions that are effective during the antenatal period are used and those that are not are excluded. All interventions have good evidence to support their use (WHO 2003:A1-F6).

2.7. The BANC Package

The generic flowcharts of the antenatal care section of the IMPAC manual, were adopted for South African conditions to develop the Basic Antenatal Care package (BANC). In addition to the adapted generic flowcharts, a purpose written Basic Antenatal Care Handbook for primary health care workers and a skills training component on compact disc were incorporated into the BANC package.

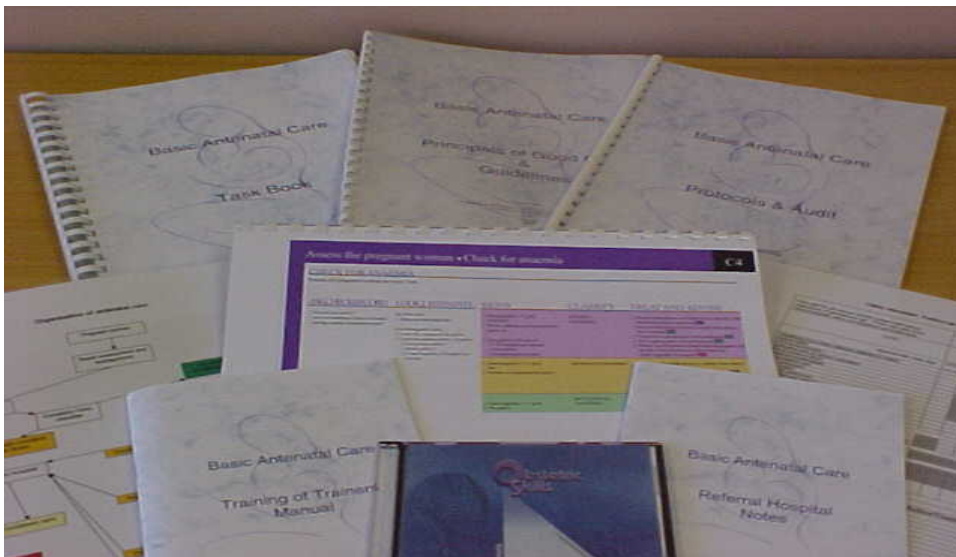


Figure 2.1: Content of the BANC package

The BANC package (Pattinson, 2005:i) consists of the following:

- * BANC Principles of Good Care & Guidelines (flowcharts)
- * BANC Protocols and Audit for facilities
- * BANC Handbook
- * BANC Task Book
- * BANC Facilitators guide for trainers

- * BANC Training of trainers file
- * BANC Information leaflets for primary health care facility managers and referral hospital managers
- * Obstetric Skills Compact Disc (Makin & Treadwell, undated)

Each component of the BANC package is briefly discussed

- * **BANC Principles of Good Care & Guidelines (flowcharts)**

The flowcharts are organised in two main groups, firstly the principles of care including administrative procedures and how to organise a visit, and secondly a group of conditions important in the care of a pregnant woman. It includes for example an assessment, classification and management of emergency conditions, pre-eclampsia, anaemia, fetal growth, post-maturity, syphilis and HIV status. Also included are the development of a birth and emergency plan, and counselling on nutrition and self care.

- * **BANC Protocols and Audit for facilities**

The book containing protocols and audit is aimed at the clinic staff to enable them to develop clinic specific protocols. For example the woman with pre-eclampsia requires referral to the nearest hospital. The protocol will contain the information required to manage and refer the woman appropriately. The management steps will include the immediate treatment, observation and monitoring required while waiting for transport, and referral detail to reach the next higher level of care with the contact name and telephone number of the referral hospital. The last pages of the book display a blank graph to record the monthly audit results of the unit.

- * **BANC Handbook**

The BANC Handbook aims to bring together basic resources related to antenatal care and facilitate their use. The aim of this handbook is to provide the knowledge to perform basic antenatal care (BANC) effectively. The Basic Antenatal Care Handbook explains the process of providing antenatal care and explains the reasoning behind the guidelines presented. The process of providing antenatal care has been simplified and only

interventions that are effective during the antenatal period are used and those that are not are excluded. All interventions have good evidence to support their use.

* **BANC Task Book**

The BANC Task Book provides the framework for conducting an analysis of services and systems prior to implementation of the BANC package with reference to the strengths, weaknesses, opportunities and threats at each clinic. The task book also contains the blank forms for developing protocols as a draft. Once the protocols are discussed and agreed to by all relevant role-players, it must be re-written in the protocol and audit book for signing off by the supervising medical officer.

* **BANC Facilitators guide for trainers**

The facilitators guide is intended for use by the master trainer to guide the training of trainers.

* **BANC Training of trainers file**

The trainer of trainers file is a guide for use by the trainers at clinic level to assist and guide the training of clinic staff.

* **BANC Information leaflets for primary health care facility managers and referral hospital managers**

These leaflets are intended for use when the managers of facilities or hospitals need to be informed of the BANC package and the implications for implementation, and the support required from such managers.

* **Obstetric Skills Compact Disc (Makin & Treadwell, undated)**

The skills compact disc assists the trainer to update trainees on the different skills related to antenatal care.

The approach in the BANC package separates the first and follow-up visits for pregnant women to clearly indicate the activities required for each. The first meeting between the professional nurse and the patient, related to the current pregnancy, is called the first visit.

The first visit is a very important visit and serves to classify the woman as requiring the basic component of care (BANC) or specialised care in addition to BANC. The patient retained antenatal card for recording care is issued at the first visit. The clinical process followed by the primary health care professional nurse for each antenatal visit is to ask specific questions, to look, listen and feel, to record signs, to classify the woman and to treat and advise. The details of these actions are described in the BANC flowcharts. The clinic record and checklist is completed and the woman advised on her next visit. Details of the first visit is summarised in table 2.4 below.

How	What	Why – Identify special conditions or risk factors for referral
Ask (Key questions)	Personal history Name Age Address and telephone or cell number Relationship with father of child Tobacco and alcohol use Housing Sanitary conditions Energy source Literate Income, occupation	Identify special conditions or risk factors for referral <16 or >34 years high risk. Refer Genetic counselling for >34 years Contact Tobacco – increased risk growth restriction, abruptio placenta Alcohol – Fetal alcohol syndrome Support system Hygiene possible Storage medication Information given to woman – written or verbal Resources available, e.g. medical aid to supply antiretroviral therapy
	Obstetric history Number previous pregnancies Year, gestational age at birth of baby, sex, birth weight Method of delivery (obstetric operations) Outcome (live, miscarriage, IUD, ENND, LND, infant deaths) Special maternal complications Special perinatal (fetal and newborn) complications	Identify special conditions or risk factors for referral More than 5 pregnancies Low birth weight (<2500g), growth-restricted, pre-term (<34 weeks), macrosomic (>4500g) Previous caesarean section Previous assisted delivery Risk for current pregnancy. If any deaths – refer Recurrent early abortion, thrombosis, embolus, hypertension, pre-eclampsia, eclampsia, abruptio placenta, placenta praevia, breech or transverse presentation, obstructed labour, third-degree tears, third stage excessive bleeding, puerperal sepsis, post-partum depression – refer Multiple pregnancy, malformed or abnormal child, Rhesus-antibody affection, resuscitation or other treatment of newborn - refer

	<p>Gestational age history</p> <p>First day of last normal menstrual period (LNMP) Cycle, regular/irregular, duration Previous contraception, type When contraception stopped When and how pregnancy was confirmed Sonar in this pregnancy Future plans for pregnancies</p>	<p>Calculate EDD</p> <p>Calculate gestational age Reliability of LNMP to calculate gestational age Determine “washout” period Reliability of LNMP to calculate gestational age Help with estimation of gestational age Accurate gestational age Introduction to contraceptive use after current pregnancy and what contraceptive method would be appropriate</p>
	<p>Medical history</p> <p>Specific conditions: hypertension, heart or renal problems, diabetes, epilepsy, asthma, tuberculosis (TB) HIV status if known</p> <p>Medication Operations other than C/S Allergies Family history: twins, diabetes, congenital abnormality</p>	<p>Identify special conditions or risk factors for referral</p> <p>High risk pregnancy - refer</p> <p>Stage, antiretroviral therapy, other medication, prevention of mother to child transmission Managed at designated clinic - refer to designated clinic Severity of medical condition, teratogenic drugs Might indicate high risk Penicillin allergy Risk for current pregnancy, might need referral</p>
<p>Look, feel, listen (Physical Examination)</p>	<p>Record weight and height</p> <p>Measure blood pressure Check general condition, pale, malnourished, jaundiced, short of breath, etc Thyroid mass, breasts</p> <p>Chest and heart auscultation Feel for uterus (if palpable measure height - cm), look for abdominal scars, especially C-section scars Consider vaginal examination using a speculum</p>	<p>Identify special conditions or risk factors for referral</p> <p>Body mass index (weight (kg)/height(m)²) - refer if BMI <18.5 or >32.3 kg/m² (malnutrition or overweight) Hypertension - refer Anaemia, chronic disease - refer</p> <p>Thyroid lump high risk - refer Ability to breast feed Heart or lung lesions - refer Correlate with estimated gestational age calculated from LNMP - if don't correlate refer for sonar If 30 years or more with no cervical smear, or suspect STI</p>

<p>Tests</p>	<p>Test urine: protein, nitrites, leucocytes, glucose</p>	<p>Identify special conditions or risk factors for referral</p> <p>Pre-eclampsia, urinary tract infection, diabetes</p>
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	Haemoglobin Rapid Rh test RPR Counselling and testing for HIV Cervical smear	Anaemia Rhesus iso-immunisation Syphilis If know status can make changes to improve lifestyle of HIV negative woman to prevent infection, or if infected, to improve general health of woman and decrease risk of transfer to infant If over 30 years and not had one before
Plan	Classify for BANC or referral Clinic Checklist	Determine level of antenatal care Check that nothing overlooked
Implement	Iron and folate supplements to all women Calcium supplementation to all women Tetanus toxoid: booster or first injection RPR positive – treat for syphilis Rh negative send Coombs test or refer HIV infected – send for full evaluation for ARVs In malaria endemic areas: sulphadoxine/pyrimethamine Refer high-risk cases – see checklist	Preventing complications Prevent anaemia Prevent hypertension and pre-eclampsia Prevent neonatal tetanus Prevent congenital syphilis and stillbirths Prevent rhesus iso-immunisation or refer for treatment Improve woman's health and pregnancy outcome for infant Prevent malaria Improve pregnancy outcome
Give advice	Safe sex Stop tobacco, alcohol Infant feeding Education about haemorrhage & warning signs Birth plan	Preventing complications and improve general health Prevent STIs Prevent fetal alcohol syndrome, growth restriction, abruptio placentae Discuss options if HIV infected, promote breast feeding if HIV negative Educate woman Where (what institution) she will give birth, arrangements for transport when goes she into labour
Questions and answers	Give time for free communication	May raise issues that are worrying woman or things left out
Schedule next visit	Write on antenatal card and clinic checklist	
Complete records	Complete clinic record Complete antenatal care and give it to the woman	Checklist helps to prevent things being overlooked Patient carried card is far more effective than clinic held notes

Table 2.4: Summary of the content of the first antenatal visit

The follow-up visits are scheduled at 20, 26, 32 and 38 weeks gestation and follow the same format as the first visit based on the WHO model of antenatal care. The content of the follow-up visits are summarised in table 2.5 below.

How	What	When				Why
Rapid assessment and management (RAM)						Act immediately if there is an emergency
Ask (Key questions)	How are you? Is the baby moving? Have you had any bleeding? Have you any concerns/symptoms of.....? Vaginitis Urinary tract infection Cough Malnutrition HIV/AIDS	20 ✓ ✓ ✓ ✓	26 ✓ ✓ ✓ ✓	32 ✓ ✓ ✓ ✓	38 ✓ ✓ ✓ ✓	Risk of ascending infections Risk of ascending infections Risk of tuberculosis, other chest infections Chronic disease, poverty Ensure proper management
Check antenatal card	Calculate current gestational age Syphilis serology Haemoglobin Counselled and tested (HIV) Booster dose Tetanus toxoid Previous visits concerns	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	Need this to fill-in antenatal card and check fetal growth Check that result has been entered and the woman treated, if necessary Check for the Hb result and treatment of any anaemia Check that this has been performed Only if immunising for the first time Have these been solved?
Look, feel, listen	Anaemia Blood pressure Urine; protein/glucose Uterine growth Fetal position (from 34 weeks)	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	Screen for anaemia, Hb again at 32 weeks Screen for hypertension Screen for pre-eclampsia and diabetes Screen for IUGR Screen for abnormal lie, e.g. breech

Signs		✓	✓	✓	✓	Note all the abnormalities
Classify		✓	✓	✓	✓	Classify the abnormalities into diseases
Treat and advise		✓	✓	✓	✓	Treat and advise according to the diseases identified.
Fill in antenatal card and revise birth plan if necessary		✓	✓	✓	✓	
Implement the following interventions	Iron and folate supplements to all women	✓	✓	✓	✓	To prevent anaemia
	Calcium supplementation to all women	✓	✓	✓	✓	To prevent hypertension
	Tetanus toxoid; booster or first injection					To prevent neonatal tetanus
	RPR positive – treat for syphilis Rh negative send Coombs test or refer	✓	✓	✓	✓	To prevent congenital syphilis and stillbirths To identify Rh iso-immunisation
	HIV infected – send for full evaluation for ARVs					To support, treat and prevent transmission
	In malaria endemic areas: sulphadoxine/pyrimethamine	✓	✓	✓	✓	
General advice	Safe sex	✓	✓	✓	✓	Prevent STIs
	Stop tobacco, alcohol	✓	✓	✓	✓	Prevent IUGR and congenital abnormalities
	Infant feeding			✓	✓	Plan for feeding after the birth of child
	Education about haemorrhage & warning signs	✓	✓	✓	✓	Early identification of complications
	Birth plan	✓	✓	✓	✓	Make sure the appropriate institution for delivery is identified and that there is a transport plan to get there
	Contraceptive advice			✓	✓	Plan for future pregnancies and allow appropriate spacing of children
Questions and answers		✓	✓	✓	✓	Enable woman to voice concerns
Date next follow-up visit		✓	✓	✓	✓	
Maintain complete records		✓	✓	✓	✓	Ensure antenatal care and clinic checklist completed

Table 2.5. Content of Follow-up Visits.

The implementation of the BANC package requires organisational changes in the way antenatal care is provided. These include the initiation of the first antenatal visit at pregnancy confirmation, the implementation of the clinic retained checklist (Annexure E.4.) which would assist in identifying risk factors in the pregnant woman and support the change to the new WHO schedule of visits, and to develop clinic specific management and referral protocols. The organisation of antenatal care is assisted by a flow diagram (see figure 2.2.) which may be displayed in the consulting room for easy access when assessing a pregnant woman.

The Basic Antenatal Care package (BANC) is a quality improvement package implemented through the training of trainers or cascade training approach. In the cascade training approach a group is trained who then go on to train others so that the educational benefit cascade downwards (Bax, 2002:165-177). The training component was designed with the collaboration of educationalists to assist in the implementation of the BANC quality improvement package and is based on adult learning principles (Gravett, 2001:8). A Training of Trainers methodology was chosen given the large number of primary health care clinics that need to be targeted. Trainers of trainers had been previously shown to work in South African primary health care clinics (Meyer, Summers & Möller, 2001: 35:833-840). The educational component is further discussed in detail in Chapter Five.

2.8. Conclusion

It is estimated that more than half a million women die each year as a result of pregnancy and childbirth; millions more become ill or disabled around the world (Islam & Gerdman, 2006:7). In Sub-Saharan Africa, an estimated 900,000 babies die each year as stillbirths during the last twelve weeks of pregnancy (Lincetto et al, 2006:52) and at least 1 million die in their first month of life. Antenatal care in Africa has reached more than two thirds of pregnant women whereas in South Africa antenatal care attendance has remained well over 90% (Beksinska et al, 2006:297). Although antenatal care attendance is high, there needs to be further critical analysis of the services themselves to improve the quality of care to pregnant women (Beksinska et.al, 2006:300). The purpose of antenatal care is to diagnose any dysfunction during pregnancy so as to anticipate problems and take the appropriate steps for a healthy delivery (Garcia, 2005:15). The outcome of pregnancy is influenced by a multitude of factors, some of which is not within the control of health providers for example the political and social environment. However other factors, more directly related to health care service provision may be influenced to varying degrees by health managers and service providers. It includes the components of antenatal care offered, the accessibility of antenatal care to pregnant women, and the content of antenatal care services. Antenatal care serves as an entry point to health services, for

many women it is their first contact with the health care system. The quality of antenatal care received by women during their first antenatal visit may influence future use of the health care system. The BANC package was developed as a quality improvement package based on available evidence, with the potential to improve care for pregnant women at primary health care level.

In the next chapter the methodology applied for implementation and assessment of the effectiveness of the BANC package will be discussed.

3.1 Introduction

Literature review in the previous chapter describes maternal and perinatal mortality as indicators of poor antenatal care in primary health care clinics. The high stillbirth rate in comparison to the early neonatal death rate is of particular concern, as a high stillbirth rate suggests a poor quality of antenatal care. Aspects of antenatal care were described which would indicate a high quality of antenatal care service at primary health care clinics. The Basic Antenatal Care Package is discussed as a possible measure of improving antenatal care at primary health care level.

The purpose of this chapter is to describe the steps followed in this study to assess the effectiveness of the BANC package. De Vos, et al. (2004:255) suggests that in the description of the methodology, descriptions of the participants, the research design, the sampling process, data collection procedures, and the measuring instruments are included. In this chapter a detailed description of the methodology of the research process as it was implemented will be discussed.

3.2. Rationale

The perinatal mortality in the Nelson Mandela Bay metropole, estimated at 50/1000 live births, is higher than the average for South Africa at 27.6/1000 (Pattinson, 2004:4). Unexplained stillbirth is related to one in four deaths in the Saving Babies Report 2003 (Pattinson, 2004:4). The causes of these unexplained stillbirths were further reviewed and described by Moran & Mangate in the Saving Babies Report 2003 (Pattinson, 2004:4) as intrauterine growth restriction, post maturity and infections in the pregnant woman. From this review it was recommended that particular emphasis should be placed on identifying

these conditions during antenatal care and that the quality of antenatal care should be addressed. Good care during pregnancy is important for the health of the mother and the development of the unborn baby. Pregnancy is a crucial time to promote healthy behaviours and parenting skills. Good antenatal care links the woman and her family with the formal health system, increases the chance of using a skilled attendant at birth and contributes to good health through the life cycle. Inadequate care during this time breaks a crucial link in the continuum of care, and effects both women and babies (The Partnership, undated:52). Antenatal care is the entry point for the pregnant woman to the health care system, not only for care of pregnancy related issues but facilitating access to programmes like HIV management and nutrition support. The quality of care during the antenatal period may impact on the health of the pregnant woman and the outcome of the pregnancy, in particular on the still birth rate.

Primary health care professional nurses are not skilled in antenatal care as their knowledge is not updated and they are not exposed to new developments in the care of pregnant women. Further to this diseases such as HIV/AIDS and tuberculosis caused primary health care nurses to have a workload in excess of what they can cope with. All this impact negatively on the care provided to pregnant women.

The researcher came to know about the BANC quality improvement package. This package is based on an integrated management approach, which may assist the professional nurses in primary health care clinics to manage the pregnant woman according to the latest evidence available. It assists decision making and it includes a quality audit of antenatal care. Monitoring the provision of antenatal care services in the Nelson Mandela Bay metropole is part of the key performance areas of the researcher. The decision to implement the BANC package to improve the quality of care provided to pregnant women, afforded the opportunity for formal research on the implementation of the BANC package.

3.3. Research Aims and Objectives

3.3.1. Aim of the study

The aim of this study was to evaluate the effectiveness of the BANC package to improve the quality of antenatal care at primary health care clinics

3.3.2. Research Objectives

The objectives of this study were to:

- Assess the quality of antenatal care delivered by primary health care professional nurses in primary health care clinics
- Facilitate the implementation of the Basic Antenatal Care package in five selected experimental clinics
- Evaluate the effectiveness of the Basic Antenatal Care package by determining the quality of antenatal care by an audit of antenatal cards
- Determine experiences of individuals involved in the training and implementation of the Basic Antenatal Care package
- Make recommendations and develop guidelines for training and implementation of the BANC package

3.4. Research Design

The research design guides the researcher in planning and implementation of the study in a way that is most likely to achieve the intended aim and objectives (Burns & Grove, 2005:211). A mixed method of quantitative and qualitative approaches was implemented. The study was, explorative, descriptive, explanatory and contextual as described in Chapter One.

3.5. Research Methodology

Research methodology focuses on the research process and the kind of tools and procedures used (Mouton & Marais, 1988:23). The research methodology was completed in two phases. The first phase was to determine the effectiveness of the BANC package to improve quality of antenatal care in primary health care clinics. Phase two was to develop recommendations and guidelines for the training and implementation of the BANC package. The research method employed to achieve the objectives of the study is summarised in Chapter One Table 1. In this chapter phase one is described according to the following steps:

- Step One: Literature review
- Step Two: Refining the audit tool
- Step Three: Pilot study of the data collection instrument
- Step Four: Determine the baseline quality of antenatal care
- Step Five: Implementation of the BANC package
- Step Six: Retest one
- Step Seven: Determine experiences of individuals involved in the implementation of the BANC package
- Step Eight: Retest two

3.5.1. Step One: Literature Review

The focus of the literature search was antenatal care and what would constitute quality of antenatal care to improve the outcome of the pregnancy for the mother and the baby. Outcome of pregnancy is measured focusing on a small group of women and babies that did not survive. It is argued that identifying problems in the management of this group of clients and addressing issues related to these problems the quality of care will improve for all pregnant women and their babies. Local literature reviewed included the review of maternal deaths in South Africa reported in the Saving Mothers Reports and the perinatal surveys of South Africa reported in the Saving Babies Reports. Current statistics and indicators were obtained through the District Health Information system. Literature

published by local experts in the field of obstetrics and midwifery were consulted. The World Health Organisation's writings on Safe Motherhood Initiative and Making Pregnancy Safer, and more recently The Partnership were studied including policy documents like the Health for All and the Millennium Development Goals. Electronic data resources were searched for publications and journal articles on the relevant topics. Where indicated publications and theses were requested through interlibrary loan for perusal. The manual for the Integrated Management of Pregnancy and Childbirth were reviewed to understand the background to the development of the BANC Package.

3.5.2. Step Two: Refining the Audit Tool

The quantitative data was collected using a pre-designed audit tool (See annexure E.1.) developed to assess the quality of antenatal care as documented on the antenatal card (Philpott & Voce, 2001: 68-76). The tool was developed by Prof. H. Philpott for use in KwaZulu Natal to improve the quality of information recorded and the decisions made. The tool lists twenty five criteria considered essential in the antenatal care of every pregnant woman. The criteria are grouped together into three main categories namely history, examination and interpretation/decision making. During audit each criterion is scored with nil, half or one mark indicating no evidence of care, some evidence of care or adequate evidence of care respectively. The scores obtained can be calculated for total or average which then can be submitted to statistical analyses for comparison and interpretation. The gestational age at first visit is added as an additional element to assess if the first antenatal visit is offered at pregnancy confirmation or early in pregnancy. The criteria is summarised in figure 3.1. below.

Three main categories:

History

This section has six criteria dealing with the history of previous pregnancies, the current pregnancy and medical history.

1. Age, parity and gravidity
2. History of previous pregnancy, including causes of death of neonates and indicating any complications or operations
3. History of previous illnesses that may influence this pregnancy, including cardiac disease, renal disease and diabetes.
4. History of present pregnancy (progress of mother and baby)
5. Last menstrual period and expected date of delivery
6. Correct plotting of the first entry on the graph after 20 weeks to illustrate the growth of the fetus.

Examination

This section deals with the examination of the woman and her baby. It includes sections of the physical examination and measurements or investigations that would provide more information to determine the well-being or health of the woman and the progress of the pregnancy.

7. Measure maternal height and weight
8. Monitor blood pressure at each visit
9. Evidence of examination of the heart
10. Correct completion of the graph (SF height) for follow-up visits
11. Interpretation of the graph
12. Fetal presentation from 34 weeks (fetal lie)
13. Monitor fetal heart and ask history of fetal movements noted
14. Urinalysis
15. Haemoglobin and Rh grouping done
16. Syphilis test result recorded
17. HIV counselled
18. Tetanus Toxoid given

Interpretation and Decisions

All the above could have been completed correctly, but without decisions and action taken where risk factors were identified, antenatal care will be of little or no benefit to the pregnant woman and her baby.

19. Identified and recorded risk factors in the space indicated for problems
20. Record of action plan including intervention & referral if indicated
21. Discussion of labour plans with mother
22. Transport arrangements
23. Future contraception plans discussed
24. 1st & 32 week visit countersigned
25. Date of the next visit
26. Gestational age at first visit

Figure 3.1. Summary of criteria on the data collection tool

The audit tool was used in its original format but where abbreviations were used it was spelled out in full. In this study a pilot study was done to assess the data collection instrument for validity and reliability. These will now be discussed.

3.5.2.1. Validity and reliability

Two major considerations determine how well a particular measurement reflects a property of an item namely reliability and validity. A measurement has high reliability if it gives the same result every time the same property is measured in the same way (Reaves, 1992:79), whereas a measurement has validity when it reflects the construct you intended to measure. No measure is perfectly reliable, but the more similar the results are, the more reliable the measure is. Validity and reliability as two of the most important concepts in the context of measurement (De Vos, et al. 2004:166) will now be described.

- **Validity**

A valid measuring instrument, De Vos, et al. (2004:166) writes, has been described as doing what it is intended to do, as measuring what it is supposed to measure, and yielding scores whose differences reflect the true differences of the variable being measured rather than random or constant errors. Thus the concept validity has two parts: the instrument actually measures the concept in question, and the concept is measured accurately. Validity according to Burns & Grove (2005:377) is not an all-or-nothing phenomenon but rather, a matter of degree. No instrument is completely valid. Thus one determines the degree of validity of a measure rather than whether or not it has validity. According to De Vos, et al. (2004: 166-167) one of the most common and useful classifications schemes attempting to categorise the validities underlying measurement is content, face, criterion and construct validity. These are briefly discussed.

- **Content Validity**

Content validity deals with the question: Does the instrument measure what we want to measure? According to De Vos, et al. (2004: 167), content validation is by and large a judgemental process. When we ask colleagues to assess our instrument we rely on their judgement to establish its content validity. The audit tool was designed by an expert obstetrician (Phillpott & Voce, 2001: 68-76) and presented to colleagues at the Saving Babies 2001 National Workshop. The audit tool formed part of a presentation done as solutions to address the quality of antenatal care, and was published as part of the Saving Babies 2001 2nd Perinatal Care Survey of South Africa (Pattinson, 2005:68).

- **Face validity**

Face validity refers to what the instrument appears to measure and if it appears relevant to those who will complete or use it (De Vos, et al. 2004:167). According to Burns & Grove (2005:377) face validity is no longer considered acceptable evidence of validity. However, it is still an important aspect of the usefulness of the instrument, because the willingness of participants to complete the instrument is related to their perception of what the instrument measures. Without face validity resistance may be encountered on the part of participants, which in turn may adversely affect the results obtained.

In utilising the tool during this study, the research assistants using the audit tool could relate to the criteria the tool measure as criteria relevant to the quality of care given to pregnant women. Comments were made that it is the first time for them that a process is started to assess the quality of antenatal care. At no point was any doubt expressed that the tool does not measure the quality of antenatal care.

- **Criterion validity**

Criterion validity involves multiple measurements and is established by comparing scores on an instrument with an external criterion known to or believed to measure the concept,

trait or behaviour studied (De Vos, et al. 2004:167). The audit tool lists the most crucial 25 criteria related to the care received by the pregnant woman during antenatal care. These criteria were identified by an expert and were presented and discussed at the Saving Babies 2001 National Workshop (Pattinson, 2005:68), where workshop participants, all experts in the field of obstetrics and midwifery, accepted and agreed on the content.

- **Construct validity**

Construct validity involves determining the degree to which an instrument successfully measures a theoretical construct (De Vos, et al. 2004:167-168). Construct validity is concerned with what and how the instrument operates and the theory underlying it. Measurement of a theoretical construct is not part of this study.

- **Reliability**

Reliability (De Vos, et al. 2004:168) has been defined as the accuracy or precision of an instrument. An instrument is reliable if two independent scorers obtain similar results. Burns & Grove (2005:374) states that if the same instrument is administered to the same individuals at two different times, the measurement is reliable if the individual's responses remain the same. There are many different techniques that can be used to determine how reliable an instrument is. The most obvious is test-retest reliability in which you simply measure the same thing more than once and compare the measurements. Another common type of reliability is interrater reliability, in which judgments of two or more different observers are compared (Reaves, 1992:79). In this study test-retest over time was used as well as interrater reliability described in the pilot study.

3.5.3. Step Three: Pilot Study of the Data Collection Instrument

A pilot study could be conducted to develop and refine a variety of steps in the research process (Burns & Grove, 2005:42) for example a pilot study could be conducted to examine the reliability and validity, or to refine the data collection tool. The pilot study could also assist to refine the data collection process. In this study the audit tool used as the data collection instrument, was tested by doing a pilot study before the baseline data collection at the selected clinics.

- **Pilot Study: Population and Sample**

The population for the pilot study was the pregnant women at one selected clinic who met the inclusion criteria (see 3.5.4.1). The sample for the pilot study was drawn from pregnant women attending antenatal care services at this one selected clinic. With permission from the manager the researcher approached the women attending the antenatal clinic. Twelve antenatal cards were selected according to the inclusion criteria for the study (see 3.5.4.1.) Informed consent was obtained from the clients to copy the antenatal card. The identifying information was removed and then the cards were copied for auditing by the fieldworkers. This ensured anonymity of the client and made it practically possible for ten fieldworkers to audit the same information simultaneously.

- **Pilot Study: Data collection**

The eleven research assistants were invited to attend a meeting on the research study which would include the implementation of the BANC package in their clinics. They were then invited to use the audit tool to assess the quality of antenatal care for the 12 patients as recorded on the 12 cards sampled. The 12 cards conveniently sampled from one clinic were then audited by the research assistants and the researcher working independently from each other. Each research assistant was identified by a number which was recorded on the audit tool. The researcher stored the results in a sealed envelope. After a period of three months the process was repeated on the same 12 antenatal cards. The research assistants were identified by the same number allocated in the first round of

audit. After this second audit the data was captured in an Excel (MS Office) spreadsheet and transferred to Statistix8[®] for analysis.

- **Pilot Study: Data analysis**

Data analysis was done by an independent statistician applying two tailed analysis of variance to correlate findings.

- **Pilot Study: Results**

The two techniques used to assess reliability in this study was test-retest over time and interrater reliability. The results are given below.

- **Test Re-test correlation**

Test Re-test correlation was done by the scoring and re-scoring of 12 antenatal cards by the research assistants and the researcher with a three month interval as described above. These scores were submitted to statistical testing. The mean scores obtained during the first scoring were correlated for each scorer with her own score of three months later (test-re-test). A Pearson coefficient was used and the scores presented in table 4.5. All scorers demonstrated a significant correlation with herself at the 0.05* level and 8 of the scorers demonstrated a significant correlation at the 0.01** level.

Test Re-test		
scorer	Correlation	P value
1	.827**	0.001
2	.735*	0.024
3	0.871**	0.002
4	0.79**	0.002
7	0.935**	0
8	0.865**	0
9	0.855**	0

10	0.689*	0.04
11	0.832**	0.001
12	0.894**	0

Table 3.1. Test – Re-test correlation of 10 scorers

- **Interrater Reliability**

Interrater reliability, in which judgments of two or more different observers are compared, was applied to the data collected during the pilot study. The researcher was used as gold standard and the total mean scores of all other scorers were correlated with the researcher’s total mean score at the first score and the score of three months later. The scores are presented in table 4.6 below. All scorers demonstrated a significant correlation with the researcher at the 0.05* level (2-tailed) and 13 of 18 scorers correlated significantly with the researcher at the 0.01** level (2 –tailed).

Interrater reliability						
Scorer	Gold	Std		Scorer	Gold	
Time1	Time1		p value	Time 2	Time 2	p value
1	0.85**		0.001	13	0.728*	0.017
2	0.741*		0.022	14	0.673*	0.047
3	0.867**		0.001	15	0.852**	0.004
4	0.761**		0.006	16	0.824**	0.001
7	0.876**		0	19	0.761**	0.004
8	0.797**		0.003	20	0.758**	0.004
9	0.755**		0.007	21	0.936**	0
10	0.689*		0.027	22	0.819**	0.004
11	0.833**		0.001	23	0.681*	0.015

Table 3.2. Results of interrater reliability comparison

The instrument used for auditing is therefore considered to be reliable and was used to audit the quality of antenatal care in this study. The next step was to determine the

baseline of the quality of antenatal care in the Nelson Mandela Bay Metropole primary health care clinics.

3.5.4. Step Four: Determine a baseline of quality of antenatal care in primary health care clinics

Arkava & Lane (cited in De Vos, et al. 2004:152) noted that the baseline represent the data collection period immediately preceding the implementation of treatment. It is thus the planned, systematic collection of data on the problem before intervention commences. The collected data are used to measure the problem initially and serve as a basis for comparison with data gathered during the treatment and follow-up sessions (De Vos, et al. 2004:153). The measurement of the baseline of the quality of antenatal care will be described with reference to the selection of the population and sample, the data collection and data analysis process.

3.5.4.1. Selection of Research Population and Sample

The research population or all the units that could be included in the study (Dane, 1990: 289; De Vos, et al. 2004:198-199) is the antenatal cards of pregnant women attending antenatal care at primary health care clinics in the Nelson Mandela Bay metropole. For the researcher to reach the population permission for the study was obtained from the managers of the primary health care clinics and referral hospitals. Meetings were held to inform managers and clinic supervisors of the purpose and methodology of the research study. Ten primary health care clinics in the Nelson Mandela Bay Metropolitan, with the highest number of antenatal attendees were identified for inclusion in the study to ensure availability of an adequate number of antenatal cards. Together with the clinic supervisors the clinics were paired for similarities in service delivery, population and size, and randomly allocated to intervention group (Scoring of antenatal cards/audit with implementation of the Basic Antenatal Care package) or control group (Scoring of antenatal cards/audit without implementation of the Basic Antenatal Care package).

In consultation with the managers, research assistants were identified to assist in auditing antenatal cards. One person per clinic for each of the ten selected clinics was identified. The research assistants identified are professional nurses employed as clinic supervisor or person in charge of the primary health care clinic selected. These research assistants were trained on how to audit the antenatal cards. They were then requested to visit the relevant clinics to audit the antenatal cards. A starting date and completion date was given allowing four weeks to collect the data.

It is often not practically possible to include the total population in the study. A sample is the smaller group chosen from the population that is measured (Reaves, 1992:94). Sampling defines the process for selecting this group of people, events, behaviours, or other elements with which to conduct the study (Burns & Grove, 2005:40; Dane, 1990:289). The research sample or smaller group of antenatal cards chosen for measurement (Reaves, 1992:94) was selected conveniently. Two selections took place. Firstly the clinics for inclusion in the study were selected by identifying the ten clinics with the highest number of antenatal attendances. Secondly the antenatal cards of pregnant women were selected who met the inclusion criteria. Antenatal cards, used for recording antenatal care, are carried by the pregnant woman. The research assistants auditing cards were on site at the antenatal clinic during the time the pregnant woman attended the clinic and selected cards of women conveniently who met the following inclusion criteria:

- Pregnant women whose visit was completed
- Pregnant women with a gestation period of 36 weeks or more
- Pregnant women with an antenatal record
- Pregnant women who gave informed written consent to participate

The sample size for this study was set at 50 antenatal cards per clinic to develop a baseline of the quality of antenatal care provided. According to De Vos, et al. (2004:199) it is generally stated that the larger the population, the smaller the percentage of that population the sample need be. If the population is relatively small, the sample size should comprise a reasonable large percentage of the population. The greater the

possibility of sample error, the larger the sample should be. However, differences of opinion exist with regard to the minimum number of respondents that should be involved in an investigation. Grinnel and Williams (cited in De Vos, et al. 2004:200) contend that 30 are sufficient to perform basic statistical procedures. Due to the time limitations of the study a period of four weeks was allowed for data collection. All pregnant women attending the clinic during this time who met the inclusion criteria were selected.

3.5.4.2. Data collection

Data collection is the precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions or hypotheses of a study (Burns & Grove, 2005:421). Quantitative data collection methods often employ measuring instruments (De Vos, et al. 2004:165). The process of data collection to establish a baseline is now discussed.

Preparation for data collection had to be completed before the process could start. The relevant clinic managers were informed of the process to obtain cooperation and support (Annexure.B.4.). The research assistants were trained by the researcher on how to score antenatal cards using the pre-designed audit instrument as discussed in 3.5.3. (Philpott & Voce, 2001: 68-76). The research assistants were also informed of the selection criteria, the need to obtain informed consent and confidentiality issues. Research assistants were also alerted to act when an omission was identified on the antenatal card, which may put the pregnant woman or her unborn baby at risk. Dates were negotiated for the audits to take place. The dates on which data collection should start and stop was communicated. Research assistants were informed to submit all completed audit forms to the researcher. The audit of antenatal cards at baseline was done during June 2005.

3.5.4.3. Data Analysis

Data analysis is conducted to reduce, organise and give meaning to the data. The analysis of data from quantitative research involves statistical techniques to test relationships

(Burns & Grove, 2005:43). The analysis of data involves breaking the data down to the parts which make up the data. Analysis does not in itself provide the answers to research questions, but prepare the data to enable the researcher to interpret the data (De Vos, et al. 2004:223). In preparation for analysis the data was captured in an Excel (MS Office) spreadsheet and transferred to Statistix8[®] for analysis. Data analysis was done by an independent statistician applying t-test and descriptive statistics.

3.5.5. Step Five: Implementation of the Basic Antenatal Care Package

The intervention in this study was the implementation of the Basic Antenatal Care package in the five experimental clinics in the Nelson Mandela Bay Metropolitan. The research assistants allocated to the five experimental clinics were invited to be trained as trainers of trainees by the researcher (master trainer). The research assistants as trainers of trainees, in turn trained the primary health care professional nurses at clinic level on the use of the BANC package. Training took place in five two hour weekly sessions over a five week period during July and August 2005. Each session have specific objectives and covered a section of the Basic Antenatal Care package. Sessions took place on Fridays, as agreed with the participants, starting at 1200, usually continuing till 1600 or until the material for the session was covered and discussions completed. At the end of each session instructions were given and agreed on training or activities which had to be completed at clinic level during the coming week before the following training sessions on the Friday. As the trainers trained at clinic level, that section of the BANC package was implemented in the clinic.

The aims of the training sessions are listed below. These indicate the content covered in each training session. It also indicated what the trainers had to do at clinic level.

On completion each session the trainers should be able:

Training	Implementation
Session 1	
<ul style="list-style-type: none"> * To understand the concept of basic antenatal care * To have basic educational skills to train professional nurses at clinic level 	<ul style="list-style-type: none"> * To orientate clinic staff to the concept of basic antenatal care * To motivate clinic staff to attend training and to implement changes as required in the BANC package
Session 2	
<ul style="list-style-type: none"> * To re-organise the clinic to accommodate first and follow-up visits according to the WHO schedule * To accommodate first antenatal visit at pregnancy confirmation * To have capacity to change the structure of antenatal care clinics (introduce checklists) 	<ul style="list-style-type: none"> * To implement the BANC checklist at the clinic * To introduce the WHO schedule of visits at the clinic * To re-arrange clinic dates and times for antenatal visits to facilitate the first antenatal visit at pregnancy confirmation * To ensure the availability of the required equipment to provide antenatal care at all points of service
Session 3	
<ul style="list-style-type: none"> * To effectively use integrated management of pregnancy flowcharts for pre-eclampsia, anaemia, infections 	<ul style="list-style-type: none"> * To introduce the integrated flow charts for pre-eclampsia, anaemia and infections at clinic level * To develop the clinic specific protocols for pre-eclampsia, anaemia and infections
Session 4	
<ul style="list-style-type: none"> * To effectively use integrated management of pregnancy flowcharts for fetal growth, maternal nutrition, fetal movement, congenital abnormalities 	<ul style="list-style-type: none"> * To introduce the integrated flow charts for fetal growth, maternal nutrition, fetal movement, congenital abnormalities * To develop the clinic specific protocols for fetal growth, maternal nutrition, fetal movement, congenital abnormalities
Session 5	
<ul style="list-style-type: none"> * To establish an audit system for antenatal care 	<ul style="list-style-type: none"> * To train clinic staff on audit and provide feedback on how audit enable them to track quality of antenatal care at clinic level

Table 3.3. Training sessions for the implementation of the BANC Package

Organisational changes in the clinic are inherent in the aims of the sessions, particularly session two. These are seen as the short term implementation goals of the BANC

package. The researcher trained the trainers using the Facilitators guide (included as part of the BANC package) to ensure that all aspects of training were completed. For each classified condition on the flowchart a clinic specific protocol was developed to assist management and referral of high risk pregnant women. On completion of all five training sessions the full package was implemented at clinic level. The research assistants linked to the control clinics were trained in audit of antenatal cards only and did not attend the above training on the BANC Package.

3.5.6. Step Six: Retest One

The audit of antenatal cards was repeated in the ten clinics conveniently identified and divided into an experimental and a control group, three months after commencement of the training of the research assistants in the experimental clinics.

3.5.6.1. Population and sample

The research population was the same as for the baseline assessment. Sampling was done in the same way that is antenatal cards were conveniently selected of pregnant women who met the inclusion criteria as listed in 3.5.4.1. and who gave consent for their cards to be audited

3.5.6.2. Data Collection

A similar process was followed as for the baseline data collection. The audit tools and consent forms were distributed to the research assistants. All research assistants were reminded of the inclusion criteria. Research assistants for the ten clinics included in the study was requested to start and complete auditing during November 2006, and to submit all audit forms to the researcher. With consent obtained the antenatal card was audited by research assistants. On completion of the data collection process the data was captured and transferred to the Statistix8[®] program for analysis.

3.5.6.3. Data analysis

Data analysis was done by an independent statistician. Statistical analysis and comparison of baseline data and retest one data were done using Student T-test and descriptive statistics.

3.5.7. Step Seven: Determining experiences of individuals involved in the training and implementation of the BANC package

The original study design did not include step seven or step eight. The preliminary results available after the first re-test indicated only a relatively small improvement in quality measured. To further explore and understand these findings a qualitative section was added and a further audit completed six months after implementation of the BANC Package. A qualitative methodology was selected to assess the views of the research assistants and managers and to understand the participants' experiences of the implementation of the Basic Antenatal Care package. The qualitative methodology followed the quantitative research and is now described.

Qualitative research is a way to gain insights through discovering meanings (Burns & Grove, 2005:52). These insights are obtained not through causality but through improving our comprehension as a whole. A qualitative approach was used in an attempt to make sense of the experiences of individuals (Denzin & Lincoln, 2003:5) involved in the implementation of the BANC package.

The following objective related to the qualitative section of the study was identified:

- To determine experiences of individuals involved in the training and implementation of the Basic Antenatal Care package

The research methodology for the qualitative section includes a discussion on the population and sample drawn, data collection, data analysis and literature control. These will now be discussed.

3.5.7.1. Selection of Population and Sample

In order to describe the study population it is necessary to answer the question: which group is of central interest to the subject matter of the study? (Ritchie & Lewis, 2003:87). In this study the only group of individuals able to provide relevant information was the trainers, managers and primary health care professional nurses linked to the intervention clinics. The research population was the five research assistants who were trained as trainers as well as managers and primary health care professional nurses of the clinics where the BANC package was implemented.

Qualitative research uses purposive sampling for selecting study participants (Ritchie & Lewis, 2003:78-79), that is participants are deliberately selected, the sample is not statistically representative, the chances for selection are unknown but the characteristics of the population are used as the basis of selection. The trainers, managers and professional nurses were purposefully selected to obtain the necessary information as they shared the common characteristic of being involved with the clinics where the BANC package was implemented. Two groups were selected in the sample namely

- * Five research assistants trained in the BANC Package who became the one group
- * Managers and professional nurses from each primary health care clinic where the BANC Package was implemented who became the second group.

The participants who were willing to participate were included in the sample.

3.5.7.2. Data collection

Interviewing is the predominant mode of data collection in qualitative research (De Vos, et al. 2004:292). In this study it was necessary to understand how individuals experienced the process of being involved with the implementation of the BANC package. Semi-structured interviews were used for data collection.

3.5.7.2.1. Focus group discussion

The first group sampled namely the five research assistants who were trained in the BANC Package were approached by the researcher with a request to join a focus group discussion.

Focus groups are group interviews (De Vos, et al. 2004:305-309) that can be used after quantitative research in order to provide insights into the meaning and interpretation of results. Data are generated by interaction between group participants (Ritchie & Lewis, 2003:171). A focus group in nursing research involves a group of people with common characteristics, who are interviewed by the researcher or facilitator, for the purpose of eliciting ideas, thoughts and perceptions about a specific topic (Holloway & Wheeler, 2004:110-111). The focus group is a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment (De Vos, et al. 2004:306). Careful planning with respect to the inclusion of the participants, the environment and questions to be asked are key to conducting effective focus groups.

An independent facilitator was used to conduct the focus group discussion. The researcher was involved in the training of the Trainers and in this process became closely involved in a work relationship with the participants. This relationship could prevent the participants discussing issues related to the training freely if interviews were done by the researcher. An independent facilitator was elected who were experienced in interview techniques but were not exposed to background knowledge of the BANC package. The facilitator who conducted the focus group interview is a senior experienced psychiatric nurse manager well versed in the technique of interviewing.

The location of the focus groups must meet the need of the researcher and the participants. For the researcher the primary concerns are the ability to hold the discussion and to capture the data. For the participants, comfort is the main concern (De Vos, et al. 2004:316). The researcher set the appointments with the participants and prepared the venue. The focus group interviews took place in a venue familiar to the participants,

where privacy could be ensured and interruptions limited, and participants could be made comfortable and provided with some refreshments. The seating was set-up in a circle (Holloway & Wheeler, 2004:114) and the tape recorder placed discreetly. The technical aspects of recording the interview were explained to the facilitator to ensure successful recording. The time was set for between 1 and 2 hours.

The questions and probes developed were discussed with the facilitator. The questions developed to elicit the required information were:

- *How did you experience your own training in the Basic Antenatal Care Package?*
- *How did you experience training other people in the Basic Antenatal Care Package?*

Some probing questions were developed to facilitate the process of the focus group discussion. These are:

- How did you experience each training session?
- What according to your experience worked during training?
- What according to your experience did not work in training?

Four of the five research assistants arrived for the appointment for the focus group interview. The facilitator was introduced to the participants and her role explained, after which the researcher left the room. On completion of the focus group interviews the recorded tapes were transcribed to facilitate data analysis.

3.5.7.2.2. Individual Interviews

The second group sampled was the managers and professional nurses from the clinics where the BANC Package was implemented. They were approached for individual interviews. The researcher contacted each participant telephonically explaining the purpose of the interview, and at the same time securing consent and an appointment suitable to the manager and/or the professional nurse for the interview. It was also explained that the interview may last approximately 1 hour and with their permission will be tape recorded. Appointments were secured for three managers and five professional nurses.

The research interview is an interpersonal situation, a conversation between two partners about a theme of mutual interest, a “*conversation with direction*” (Kvale, 1996:125). Interviews provide an opportunity to obtain information related to the person’s experiences, behaviours, thoughts, and feelings. Interviewing involves a complex set of dynamics between the researcher and participant and is dependant on the knowledge base and interviewing skills of the researcher (Tutty, Rothery & Griennell,1996:52). Semi-structured interviews, often used in qualitative research (Holloway & Wheeler, 2004:82), have questions with a focus on the issues or topic areas to be covered. The sequencing of the questions is not the same for every participant as it depends on the process of the interview and the responses of each individual. The guiding question(s) ensures that the researcher collects similar information from all informants. Semi structured individual interviews were elected for data collection from the group of managers and professional nurses. The question developed for obtaining information individually from the managers and professional nurses at clinics where the BANC Package was implemented was:

- *How did you experience the implementation and training of the basic antenatal care package in your clinic?*

Appointments were made for individual interviews with managers and professional nurses. For the semi structured individual interviews some difficulty was encountered to control the environment. Managers and professional nurses preferred to be interviewed in their offices or a consulting room at the clinic. This ensured privacy but interruptions for example the telephone was difficult to control. The interruptions made it difficult to focus on the interview and to maintain rapport with the participant. Interviews were audio taped to allow the researcher to focus on conducting the interview and to maintain rapport with the participant, without being anxious to remember all details of the interview (Tutty, Rothery & Griennell, 1996:68). Verbal consent to record the interview was obtained at the start of the interview.

Unlike everyday conversation, research interviews are set up by the interviewer to elicit information from participants and the discovery of participants’ feelings, perceptions and

thoughts (Holloway & Wheeler, 2004:80). Preparing to do research interviews has to do with getting yourself ready (Tutty, Rothery & Griennell, 1996:60) and includes the process of ridding yourself of your own biases and assumptions. The quality of the interview depends mainly on the skills of the researcher as interviewer (De Vos, et al. 2004:292). It is also important that the interviewer is familiar with the project and its goals and the frame of reference of the participant. Challenges would include establishing rapport in order to gain information from participants, coping with unanticipated problems and rewards in the field and recording and managing the large volume of data generated by even relatively brief interviews. De Vos, et al. (2004:293) provides techniques and tips for the researcher. The tips used are listed here:

- The participant must do 90% of the talking. The interviewer should listen more and talk less.
- Ask clear and brief questions. It is important to use words that make sense to the participant.
- Ask single questions. Ask one question at a time.
- Ask truly open-ended questions. Open ended questions do not pre-determine the answers and they allow room for the participants to respond in their own terms.
- Avoid sensitive questions. The participant may feel uneasy and adopt avoidance tactics if the question is too deep without the necessary rapport.
- Sequence questions. Funnel questions from general to specific.
- Don't worry if your questions are not as beautifully phrased as you want them to be for posterity. A few fumbled questions might help to put your participant at ease.
- Ask questions when you do not understand.
- Avoid leading questions.
- Repeat key questions throughout the interview
- Encourage a free reign but maintain control
- Allow for pauses in the conversation
- Return to incomplete points
- End the interview at a reasonable time

It was also important for the researcher to take note of common pitfalls in interviewing as described by Field and Morse cited in De Vos, et al. (2004: 295-296). These are

- Interruptions. This distracts the participants so that thoughts are lost. The telephone is the most common interrupter
- Stage fright. The use of a tape recorder and open ended questions can make the participant feel vulnerable
- Avoid awkward questions
- Jumping. Avoid asking questions in an apparently illogical order
- Teaching and preaching. The researcher may become trapped in a teaching mode by a question asked by the participant.
- Counselling.
- Presenting ones own perspective
- Superficial interviews

According to Tutty, Rothery & Griennell (1996:71) there are four key tasks to be accomplished in conducting the qualitative research interview. These are discussed in the following section.

- Engaging: During this phase a relationship of trust should be developed and rapport established between the researcher and the participant. Establishing trust already starts at the beginning when the participant is approached for the interview explaining the purpose and request for participation. Building rapport is about making interviewees comfortable and at ease, mostly done by giving them some information related to the study, and stating the importance of their contribution.
- Contracting: According to Tutty, Rothery & Griennell (1996:72), this task involves obtaining the participant's meaningful involvement, which includes understanding the purpose of the interview and accepting the conditions under which it is conducted. Contracting involves obtaining consent, which already starts when the participant agrees to take part in the interview, and is re-affirmed

at the start of the interview. Contracting represents a mutual recognition and acknowledgement of the ethical considerations of the study. Consent was obtained and steps to ensure confidentiality and anonymity explained to the participants.

- **Conducting:** According to Paton cited in Tutty, Rothery & Griennell (1996:75), some of the different dimensions of experience the interviewee may reveal includes experience, behaviour, opinions, values, feelings, emotions, knowledge, facts, sensory and demographic data. At the start of the interview the researcher briefly explained the process to the participant, including a reminder of the purpose, the use of the audio tape and the assurance of confidentiality. A verbal consent was recorded at the beginning of the interview. During each interview the researcher tried to get the participant to open up and express ideas clearly, to elaborate on ideas and to focus on issues at hand (De Vos, et al. 2004:301).
- **Terminating:** The central consideration in the terminating task is to complete the interview at an appropriate point (Tutty, Rothery & Griennell, 1996:78). The following suggestions are provided by the authors:
 - Ask if there is anything more the interviewee wants to add
 - Summarize briefly
 - Reiterate how the information fits into this study
 - Ask feedback on how the interview went for them
 - If appropriate offer the opportunity to review the transcribed notes

Interviews were concluded by thanking the interviewees for their time and willingness to take part as well as their contribution to the study. Guidelines to stop gathering data described by Lincoln and Guba as cited in Tutty, Rothery & Griennell (1996:82) includes when all resources have been exhausted or when saturation is reached with emergence of duplication of data. In this study for the first group all the research assistants trained were included. For the second group managers and clinic sisters were interviewed until data saturation occurred. All interviews were transcribed and typed in preparation for analysis.

Field notes should include both empirical observation as well as interpretations (De Vos, et al. 2004:304). Field and Morse, cited by De Vos, et al. (2004:319) describe the field notes as a written account of the things the researcher hears, sees, experiences and thinks in the course of collecting or reflecting on the data obtained during the study. According to Tutty, Rothery & Griennell (1996:79) reflecting is an activity that must take place in all qualitative research, especially during the data collection phase. In this study the researcher reflected on the process of interviews reviewing the interview process and the responses from the interviewees, and how this relates to the findings of the quantitative section.

3.5.7.3. Data analysis

Data analysis is the process of bringing order, structure and meaning to the mass of collected data (De Vos, et al. 2004:339) and is a search for general statements about relationships among categories of data. Qualitative analysis techniques use words rather than numbers as the basis for analysis (Burns & Grove, 2005:535). The process of data analysis involves making sense out of text data. It involves preparing the data, conducting the analysis, moving deeper and deeper into understanding the data, representing the data, and making an interpretation of the larger meaning of the data (Creswell, 1998:190). Interviews were transcribed and typed together with the field notes in preparation for data analysis (Example: Annexure D). Data was analysed according to the method of Tesch (cited in Creswell, 1998:190-195) by coding data and identifying themes and sub-themes. The steps enabled the researcher to be systematically involved in the data and it facilitated the process of analysis. The steps are as follows:

- Get the sense of the whole from the participants' ideas about their experiences in training and implementation of the BANC package. Read through all the transcripts carefully to make sense, highlighting some words and writing down ideas that come to mind

- Pick one interview – the most interesting, the shortest, or the one on top of the pile. Go through it asking yourself what is this about? Think about the underlying meaning, writing thoughts in the margin
- When this task has been completed for all the participants, make a list of topics. Cluster similar topics, arranging it as major topics, unique topics and leftovers.
- Go back to the data with this list. Abbreviate topics as codes and write the code next to the relevant text. Note any new categories or codes which emerge.
- Find the most descriptive words for your topics and formalise the codes. Reduce the list of categories by grouping relevant topics
- Make a final list and write the codes alphabetically
- Assemble related data per category and perform preliminary analysis
- Recode the existing data if necessary

On completion of this process the data was presented to an independent coder for review, analysis and coding. (See annexure D.3.) A set of the transcribed interviews and the steps followed in analysis according to Tesch's model was given to the independent coder. Identified themes and sub themes were discussed until consensus was reached between the researcher and the independent coder.

3.5.7.4. Pilot study

In qualitative research the pilot study is usually informal with the purpose to determine whether the relevant data can be obtained (De Vos, et al. 2004:337). In this study the first interview was considered the pilot study and it provided the researcher the opportunity to gain some experience of what information is generated with the research question asked. It also provided an idea of the time required for completion of all interviews. The focus group was not piloted as the group was too small.

3.5.7.5. Literature control

In qualitative research, the purpose and timing of the literature review vary based on the type of study conducted. In this study themes and sub themes were identified and compared to existing literature.

3.5.7.6. Ensuring trustworthiness

Guba's model (cited in Krefting, 1991:214-222) will be used to ensure trustworthiness of the research. This model, widely used by social researchers and published by Krefting (1991:214-221), will be used as bases for discussion.

- **Truth Value**

The concept of truth value is used to determine whether the researcher has established confidence in the truth of the findings based on the research design, informants and context. Truth value is established through the strategy of credibility which is usually obtained from the researcher's discovery of the lived experience of the participants (Lincoln & Guba in Krefting, 1991:215) and the adequate representing of those experiences by the researcher. Sandelowski cited in Krefting (1990:216) suggested that a qualitative study is credible when it presents such accurate descriptions or interpretations of human experience that people who also share that experience would immediately recognize the description. In this study the following criteria will be considered to ensure credibility:

- **Prolonged and varied field experience**

Prolonged and varied field experience assists the researcher to develop an in-depth understanding of the subject under study and can convey details about the site and people that lends credibility to the narrative account. This includes investing sufficient time

during data collection (Polit & Hungler, 1995:362). The researcher allowed sufficient time for the interviews.

- **Reflexivity**

Reflexivity means that researchers critically reflect on their own preconceptions and monitor their relationships with the participants and their own reactions to participants' accounts and actions (Holloway & Wheeler, 2004:263). This self-reflection creates an open and honest narrative that will resonate well with readers. As the main tool in the research, researchers are part of the phenomenon being studied and must reflect on their own actions, feelings and conflicts experienced during the research. If they adopt a self-critical stance to the research and their own role, relationships and assumptions, the study will become more credible and dependable. The researcher reflected carefully on the bias she can bring into the study through all the phases of data collection, analysis, interpretation and reporting.

- **Triangulation**

Different data sources of information are used in triangulation (Creswell, 1998:196) by examining evidence from the sources and using it to build a coherent justification for themes. Triangulation is the process by which the phenomenon or topic under study is examined from different perspectives (Holloway & Wheeler, 2004:260). Denzin (in Holloway & Wheeler, 2004:260) identified four different types of triangulation listed below:

- Data triangulation is where multiple data sources are used from different groups, settings or at different times. A mixed method approach was used in this study with qualitative data obtained through focus group and individual interviews. The participants, involved in the experience of training and implementation of the BANC package, from their different professional roles had different perspectives on the process. These were compared and triangulated with theme identification.

- Investigator triangulation is when more than one expert researcher is involved in the study. Only one researcher was involved in this study, investigator triangulation was therefore not possible.
- Theoretical triangulation is when the researcher employs several possible theoretical interpretations in the study. Explanations are tested against each other to find the one most suitable to describe identified themes. The researcher used literature control to support themes and sub themes identified.
 - **Peer examination**

Peer examination involves locating a person (a peer debriefer) who reviews and asks questions about the qualitative study so that the account will resonate with people other than the researcher. It means that a colleague competent in qualitative research procedures re-analyse the raw data, listen to the researcher's concerns and discuss them. At the point where the researcher identified the main themes, the transcripts of the interviews were presented to an independent coder for re-coding. A discussion was held between the independent coder and the researcher to reach consensus on the themes and to detect any biases.

- **Interview technique**

Credibility can also be enhanced within the interview process. The reframing of questions, repetition of questions, or expansion of questions on different occasions are ways to increase credibility (Krefting, 1991:220). In this study the same content question were asked and some probes were used to provide consistency within the interview process.

- **Establishing authority of the researcher**

Viewing the researcher as instrument tool is addressed by Miles & Huberman in Krefting (1991:220). Four characteristics of the researcher are reviewed to increase credibility:

- The degree of familiarity with the phenomenon and the setting under study
- A strong interest in conceptual or theoretical knowledge
- The ability to take a multidisciplinary approach
- Good investigative skills

Although the researcher is a novice to qualitative research, she has been involved previously in research projects, has a strong theoretical knowledge, is familiar with antenatal care provided in the current context of the health system, and has some experience in therapeutic interviews. The researcher attended a post graduate research course on methodology. The research supervisor is an experienced researcher.

- **Referential adequacy**

Tutty, Rothery & Griennell (1996:126) suggests that the researcher should have records of all the interviews, audiotapes, transcripts and field notes available. Copies of these were kept by the researcher.

- **Applicability**

Applicability refers to the degree to which the findings can be applied to other contexts and settings. Sandelowski, in Krefting (1991:216) argues that in qualitative research which is conducted in naturalistic settings, with few controllable variables, the ability to generalise is not always relevant. Guba, in Krefting (1991:216) presented the perspective of transferability as the criterion against which applicability of qualitative data is assessed. Applicability is ensured by using strategies of transferability. Transferability refers to whether a particular finding from one study can be transferred to another similar context and still has the same meaning, interpretation and inferences. As Lincoln & Guba (1985) cited in Krefting (1991:221) noted, it is not the researcher's job to provide an index of transferability; it is his or her responsibility to provide an adequate description to allow transferability judgements to be made by others.

- **Dense description**

Dense descriptions use rich thick descriptions to convey findings. This may transport readers to the setting and give discussion an element of shared experiences. Thick description, a term coined by Geertz (1973) cited by Holloway & Wheeler (2004:262) means a detailed description of the process, context and people in the research, inclusive of the conceptual meaning the researcher develop. Thick description is then a “*rich and holistic, and even artistic portrayal of the phenomenon under study*” (Holloway & Wheeler, 2004:262). Readers of the research report should feel that they were present when the researcher carried out the study, saw, heard and felt what he or she did, and draw similar conclusions. The researcher attempted in every way to describe the context, participants and experiences of participants in the training and implementation of the BANC package in a dense description.

- **Consistency**

The third criterion of trustworthiness considers the consistency of the data that is whether the findings would be consistent if the study were to be replicated with the same participants in a similar context (Krefting, 1991:216). The key to qualitative work is to learn from participants rather than control for them. Qualitative research emphasizes the uniqueness of the human situation, so that variation is experienced rather than identical repetition is sought. Thus variability is expected in qualitative research, and consistency is defined in terms of dependability. Qualitative research looks at the range of experience rather than the average, so that atypical or non-normative situations are important to include in the findings. Consistency is ensured by using strategies of dependability. Guba, in Krefting (1991:221) proposed that dependability refers to the reliability of data. This means that the reader will be able to evaluate the adequacy of analysis through following the decision-making process of the researcher (Holloway & Wheeler, 2004:254).

- **Dense description of research methods**

The method of data gathering, analysis, and interpretation in this study was described. Such dense descriptions of methods provide information as to how repeatable the study might be or how unique the situation presented (Kielhofner in Krefting, 1991:221).

- **Stepwise replication**

Two researchers or an independent person repeat a step in the research process. In this study it was achieved by a code re-code procedure for the data analysis, followed by a consensus discussion.

- **Peer examination**

The use of peer educators or methodological experts to check the research plan and implementation is another means of ensuring dependability (Krefting, 1991:221). The researcher as student has the opportunity to discuss study methods with study supervisors. The implementation of the BANC Package was discussed with one supervisor who is an expert on the BANC Package. Further peer examination was possible by presenting the study to two methodological experts.

- **Neutrality**

Neutrality, defined as the freedom from bias in research procedures and results (Sandelowski in Krefting, 1991:216), refers to the degree to which the findings are solely a result of the research and not other biases or perspectives; the emphasis thus being on the neutrality of the data. Neutrality can be measured against the strategy of confirmability. According to Polit & Hungler (1995:363), this strategy refers to the objectivity or neutrality of the data which allows for agreement between two or more independent persons about the data's relevance or meaning. The following criteria will be used to ensure confirmability.

- **Triangulation**

Already discussed

- **Reflexivity**

Already discussed

- **Present negative or discrepant information that runs counter to the themes.**

Because real life is composed of different perspectives that do not always coalesce, discussing contrary information adds to the credibility of an account for the reader. Erlanson cited in Holloway & Wheeler (2004:259) state that '*negative case analysis involves addressing and considering alternative interpretations of the data*', especially those which may be contrary to their own view of reality. The researcher, in discussing results and findings, presented data which may reflect contrary ideas or information opposed to the themes identified.

3.5.8. Step Eight: Retest Two

The audit of antenatal cards was repeated in the ten clinics conveniently identified and divided into an experimental and a control group, six months after commencement of the training of the research assistants in the experimental clinics. This was the final audit in the study.

3.5.8.1. Population and sample

The research population was the same as for the baseline assessment. Sampling was done in the same way that is antenatal cards were conveniently selected of pregnant women who met the inclusion criteria as listed in 3.5.4.1. and who gave consent for their cards to be audited

3.5.8.2. Data Collection

A similar process was followed as for the baseline data collection. The audit tools and consent forms were distributed to the research assistants. All research assistants were reminded of the inclusion criteria. Research assistants for the ten clinics included in the study was requested to start and complete auditing during March 2007, and to submit all audit forms to the researcher. With consent obtained the antenatal card was audited by research assistants. On completion of the data collection process the data was captured and transferred to the Statistix8[®] program for analysis.

3.5.8.3. Data analysis

Data analysis was done by an independent statistician. Statistical analysis and comparison of baseline data, retest one data and retest two were done using Student T-test and descriptive statistics. The tests used for analysis are listed in table 3.3.

Statistical method	Difference between clinics at baseline
Independent T-test	Effective intervention (comparison between intervention group and audit group)
Paired t-test	Differences between baseline audit, retest one audit and retest two audit
ANOVA (analysis of variance)	Effects of differences between clinic scores before and after intervention
Correlation (Pearson coefficient)	Interrater variability

($p < 0.05$ is significant)

Table 3.4. Statistical tests applied for data analysis

The interpretation of the quantitative data will be discussed in Chapter Four.

3.6. Ensuring ethical standards

Ethical issues as discussed in Chapter One were implemented and adhered to throughout the research process.

3.7. Conclusion

The methodology of the research conducted was reviewed in this chapter. A mixed method sequential strategy was applied, describing first the quantitative section followed by the qualitative section. In Chapter Four the quantitative results are discussed with the qualitative results described in Chapter Five.

4.1 Introduction

The aim of this study was to assess the effectiveness of the Basic Antenatal Care Package (BANC) to improve the quality of antenatal care provided to pregnant women attending primary health care clinics in the Nelson Mandela Bay Metropole, as measured by a pre-designed audit tool. It was postulated that the implementation of the BANC package will improve the quality of antenatal care in primary health care clinics. A trainer of trainees' methodology was chosen for implementation as the most appropriate and cost effective option for South African primary health care clinics (Meyer, Summers & Möller, 2001:833-840). The methodology used was described in Chapter 3. In this chapter the analysis and interpretation of the quantitative results will be discussed.

Data analysis in quantitative research involves the breaking down of the data into the smallest elements. Analysis in itself does not provide the answers to research questions. Interpretation of the data is necessary. To interpret is to explain and to find meaning. It is difficult to explain raw data; one must first describe and analyze the data and then interpret the results of the analysis. The purpose of analysis is to reduce data to an intelligible and interpretable form so that relations of research problems can be studied and tested and conclusions drawn (De Vos, et al., 2004:223).

The objectives of this study linked to the quantitative section were:

- To assess the quality of antenatal care delivered by primary health care professional nurses in primary health care clinics
- To facilitate the implementation of the Basic Antenatal Care package in five selected experimental clinics

- To evaluate the effectiveness of the Basic Antenatal Care package by determining the quality of antenatal care by an audit of antenatal records

Data collection for the quantitative section of the study was done by an initial auditing of antenatal cards from all ten sampled clinics with a pre-designed audit tool to determine a baseline quality of antenatal care provided in these clinics. The results from this audit are referred to as Time 1. The implementation of the Basic Antenatal Care package followed in the five selected clinics using the trainers of trainees approach. After the implementation of the BANC Package two further audits were done to determine the quality of antenatal care at the ten selected primary health care clinics. An audit was done three months after the implementation and this will be referred to as Time 2. The final audit was done six months after implementation of the BANC Package and this will be referred to as Time 3. The results of the three audits will be discussed together.

Data analysis was done using the software program Statistix 8[®], applying independent t-test, paired t-test, descriptive statistics, ANOVA and Pearson correlation. An independent statistician analyzed the data. A description of demographic data is followed by a discussion of the organizational changes required with the implementation of the BANC package. Quality improvement of care is then discussed based on the findings from the audit of antenatal cards. The chapter concludes with a discussion on the effectiveness of the BANC package to improve the quality of antenatal care with reference to audit results and statistical analyses.

4.2. Preparation for the study

Ten primary health care clinics from the Nelson Mandela Bay Metropole (NMBM) were included in the study. The District Health Information System (DHIS) accessed by the researcher, was used to assess the indicator ‘total antenatal attendance’ to select the ten clinics in the NMBM with the highest number of antenatal visits for inclusion. Clinics

were paired for similarities and one clinic of each pair was selected for inclusion in the experimental group by flipping a coin. The other five clinics formed the control group.

4.3. Determining the baseline of the quality of antenatal care

Following permission from relevant authorities and senior management (See Annexure A & B) the data collection started in June 2005. The mid level managers of the ten selected clinics were informed of the study (Annexure B.4.) stating the purpose and requesting cooperation. In consultation with these clinic managers a research assistant was identified for each of the ten clinics selected for inclusion in the study. The research assistants were the clinic supervisors (in the provincial clinics) and principal sisters (in the municipality clinics). Both these groups represent a supervisory level professional nurse tasked with supervision of the day to day activities in the clinics.

The researcher trained the research assistants to audit antenatal cards using the pre-designed audit tool. Issues of confidentiality and consent were explained and each research assistant was provided with the necessary consent forms and audit tools. The inclusion criteria were discussed. It was emphasized that should the research assistants identify a missed opportunity or risk factor the sister in charge of the clinic would be informed and the necessary intervention implemented immediately to prevent harm to the patient. These audited cards could still be included in the study as the intervention that followed was not audited. These audited cards will not compromise the study as the audit would be completed by the time the missed intervention was reported and acted on.

This first audit was done before the intervention to obtain a baseline assessment of the quality of antenatal care in the five experimental and the five control clinics. The objective was to audit 50 antenatal cards for each clinic. In addition to the clinic cards of pregnant women audited at clinic level, the researcher audited cards from the referral hospital of women who already delivered, for each of the ten clinics, during the same time period, to support reaching the target. The cards audited by the researcher were included with the records of the appropriate clinic where the woman had been treated

previously. From the onset it was noted that for the smaller clinics it would be difficult to reach the target of 50 cards per clinic for auditing.

4.4. Implementation of the BANC Package

On completion of the baseline audit the researcher started to prepare for the implementation of the BANC package according to trainer of trainee principles. All the training material required was collected. The trainers were selected in cooperation with managers and supervisors. Five professional nurses were selected whom had already been involved in the initial baseline audit. The professional nurses were from the experimental clinics and were selected to be trained as trainers of trainees. The dates and venue was agreed on and the venue prepared accordingly. Training started in July 2005. The training was presented over five consecutive weeks on Friday afternoons as this was reported as a quieter time at clinics and mutually agreed on. Although the training was planned as a two hour session, all sessions continued well beyond this time, starting at 12h00 and ending after 15h00. One trainer who were a clinic manager attended the first session and then withdrew from the training due to time constraints, but motivated for a professional nurse to take her place. One trainer missed the last session. All other training session were attended by all five trainers.

The training sessions were planned using the facilitators guide to complete the objectives of each session. During the first session the BANC packages were handed out and a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis was done for each clinic. The second session involved the training on how to re-organize the clinic to accommodate first and follow-up visits according to the WHO schedule, to accommodate the first antenatal visit at pregnancy confirmation and to introduce the checklist for basic antenatal care. This was seen as organizational change and the researcher guided the process by a discussion of plans on how to practically effect this change. The third and fourth sessions focused on developing clinic specific protocols for specific conditions in the pregnant woman.

The researcher presented the theory for example what a protocol is and the format for protocol development. The BANC workbook (Component of the BANC package) was used as a rough copy and was used by the trainers to develop their own clinic specific protocols. During the training session an opportunity was given to work on some of the protocols. This involved reference to the BANC Handbook (Component of the BANC package) and other relevant material for example the National Guidelines on Maternity Care for SA (Department of Health, 2002:1-140) and the Standardized Treatment Guidelines: Essential Drug List (Department of Health, 2003:1-364). The trainers divided themselves into two groups to work together and share ideas. A specified time was allowed for the trainers to work on the protocol after which a discussion was held in the bigger group to share ideas and reach consensus on what should be included in each protocol. Each session also included a section for practical skills demonstration and all trainers took turns to demonstrate a particular skill, followed by a discussion of what is acceptable and how to transfer these skills to other professional nurses at the clinic. The protocols could not be completed during the training period and a target date was agreed on for completion.

On completion of every training session the trainers were instructed to repeat the session at clinic level during the week in between their own training sessions, and to implement the organizational changes to accommodate the BANC principles. For example after every session they were expected to return to the clinic and orientate clinic staff on the content they were exposed to, including a demonstration or discussion of the practical skills they had demonstrated to them during training. When developing protocols it was expected of the trainers to discuss the content with other clinic staff to create an awareness of new evidence related to antenatal care and to obtain their input. This process contributed to all clinic staff 'owning' the protocol as a clinic specific protocol. At the beginning of each session an opportunity was given for feedback and problems encountered during the previous week. Discussion on these feedback sessions focused on the SANC rule related to the number of visits a pregnant woman should have before delivery and the difficulty staff experienced to change to the new schedule of visits. The

development of the protocols generated much discussion on for example the exact steps and dosages of medication required.

The researcher completed the training programme for the trainers in five weeks. After completion of the training the researcher provided support to the trainers in the form of a telephone call and encouraged the trainers of trainees to communicate if challenges were experienced. Calls often resulted from a request for checklists and antenatal cards, which was provided by the researcher to the experimental clinics for the duration of the study. An additional session was to review progress and discuss challenges.

Two consultative meetings were held with the Head of Department of Obstetrics of the referral hospital for verification and agreement on the protocols. The researcher typed a 'protocol prototype' which the Head of Department could read and consent to sign. One example of a protocol is included as Annexure E.3.

The professional nurses working in the clinics in the control group did not receive the training on the BANC package. The research assistants reported that some feedback on audit results, particularly related to gaps in recording was given to staff at clinics in the control group. The control group received audit and feedback with some impact on the professional nurses working at the control group of clinics. This may have affected the outcome of the audits done at three and six month intervals. The professional nurses in the control group were not trained in the BANC package implementation. This group will be referred to as the audit and feedback group.

Three months were allowed to pass between training of the trainers and implementation of the BANC package and the first post intervention audit. This audit took place in November 2005. The research assistants from all ten clinics involved in the study were reminded of the follow up audit and provided with the necessary audit and consent forms. The starting date was the first week in November and all audit forms had to be returned to the researcher by the first week in December. The audit was done in all ten clinics.

The first analysis of the data was done in December 2005. Data analysis was done on the data collected from all ten clinics included in the study. The preliminary analysis showed a small but significant improvement in scores for the experimental clinics, and also showed a small but significant increase in the audit and feedback clinics. These results prompted the researcher to add a qualitative component to the study in an attempt to understand the experiences of individuals involved in the implementation of the BANC package. The results for the qualitative section are discussed in Chapter Five. It was decided to repeat the audit of all ten clinics once more after a six month interval following implementation of the BANC package. The final audit was completed during March 2006. A similar procedure was followed as for the other audits. Managers were informed and the research assistants were given audit and consent forms. Motivation to complete the audit especially in the audit and feedback group was declining and the number of cards audited was less than for the first post intervention audit.

The results of these audits will now be discussed.

4.5. Demographic Data of the Participating Clinics

In table 4.1. below demographic data for the ten clinics are presented. The ten clinics are compared for a number of criteria indicating for example the type of clinic, the population served and the staff component for antenatal care. The indicators reflecting activity was obtained by accessing the District Health Information System (Department of Health, <http://www.health.ecprov.gov.za>).

Clinic Name/ Number	1	2	3	4	5	6	7	8	9	10
Criteria										
Total population served by clinic	75888	29912	34215	35896	51405	40652	20519	47475	26950	42738
Clinic type	Clinic within MOU at CHC	Clinic	Clinic within MOU	Clinic within MOU at CHC	Clinic at CHC	Clinic	Clinic	Clinic	Clinic	Clinic
Vertical or horizontal ANC service	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Schedule of visits used	SANC	SANC	SANC	SANC	SANC	SANC	SANC	SANC	SANC	SANC
First visit <20weeks % for 2005	16	12.5	30.2	19	20	28	22	38.6	21	35
Total number first visit for 2005	1982	922	1394	900	1081	2061	924	911	2159	1076
Total number of follow up antenatal visits for 2005	6203	1846	6655	3549	4069	3957	3651	2529	3441	4398
Total number of antenatal visits for 2005	8185	2768	8049	4449	5150	6018	4575	3440	5600	5474
Referral centre for normal delivery of patients	Yes	No	Yes	Yes	No	No	No	No	No	No
Total number of professional primary health care nurses	11	16	15	12	3	16	9	6	11	15
Total number allocated to antenatal care	3	2	1	1	1	3	1	1	2	2
Total number with advanced midwifery training	1	0	2	1	0	0	0	0	0	0

Table 4.1: Demographic data for the ten clinics included in the study

The ten clinics with the highest number of antenatal patients attending in the NMBM were selected for inclusion in the study. Within these ten clinics there was variation in geographical data. The total number of visits for the clinics included in the study ranged between 217 per month as the lowest and 676 per month as the highest. Antenatal care was provided on specific days with a special day for first visits once a week and a special day for follow-up visits at all clinics. Units where deliveries are conducted had a midwife with advanced midwifery training.

Together with clinic supervisors the clinics were paired for similarities in service delivery, population size served, size and location. Clinic pairs are given in Table 4.2 below.

	Experimental Group	Audit and Feedback Group
Pair	Clinic Number	Clinic Number
Pair One	3	4
Pair Two	5	1
Pair Three	2	6
Pair Four	7	8
Pair Five	9	10

Table 4.2. Clinic pairs for experimental and audit and feedback groups.

4.6. Results

The results are discussed in two sections. Firstly the organizational changes for BANC implementation are discussed followed by the audit results reflecting the quality of antenatal care in primary health care clinics.

4.6.1. Organizational changes for BANC implementation

The implementation of the Basic Antenatal Care package was done through the trainer of trainees' method, and addressed issues related to reorganization of the way antenatal care is provided at primary health care clinics. These organisational changes correlate with the aims of the training sessions and need to be in place before a measured quality improvement as determined by audit of antenatal cards can be expected. They are:

- To implement a clinic retained checklist which would assist in identifying risk factors and support the change to the new WHO schedule of visits
- To develop clinic specific protocols for patient management and referral criteria compatible with current national norms and standards
- To define referral routes
- To initiate antenatal care at pregnancy confirmation

These will now be discussed.

4.6.1.1. Implementation of the clinic retained checklist to support the new WHO schedule of visits

A clinic retained checklist (Annexure E.4.) to classify pregnant women for risk factors was introduced in the experimental clinics. The checklist is discussed in detail in Chapter Two. The checklist supported the implementation of the new WHO schedule of visits in all the experimental clinics. A section of the checklist is presented below to illustrate how the checklist is linked to the visits.

First visit for all women at first contact with clinics, regardless of gestational age. If first visit later than recommended, carry out activities up to that time	<i>VISITS</i>				
	1	2	3	4	5
DATE :					
Approximate Gest. Age.	___	(20) ___	(26) ___	(32) ___	(38) ___
Classifying form which indicates eligibility for BANC					
History taken					
Clinical examination					
Estimated date of delivery calculated					
Blood pressure taken					

Figure 4.1: Section of the checklist indicating the table to record the antenatal visits

4.6.1.2. Development of clinic specific protocols for patient management

Clinic specific protocols for patient management and referral criteria, compatible with current national norms and standards were developed. (Example: Annexure E.3.). Each trainer of trainees, together with the clinic staff at the experimental clinic developed their own protocols for patient management based on and incorporating the Guidelines for Maternity Care in South Africa (Department of Health, 2002:1-140) and the Standard Treatment Guidelines: Essential Drug List (Department of Health,2003:1-364). Protocols were drafted in the ‘Workbook’ (Component of the BANC package) and once discussed and finalized, re-written neatly into the ‘Protocol Book’ (Component of the BANC package). Signatures from the supervising doctor and clinic staff on each protocol would ensure accuracy and ownership. These protocols link with the defining and revising of referral routes which is discussed next.

4.6.1.3. Defining and revising referral routes and criteria

Referral routes were defined or where it existed revised. Clear, written, detailed, clinic specific referral routes with contact names and telephone numbers were established for the experimental clinics. The referral protocol was based on available guidelines and

treatment regimes but is specific to the clinic in that for example the person’s name, where applicable, would be written with the relevant telephone number. This would then immediately be available if necessary to refer a client. Revisiting the referral routes clarified the process and the place or next level where a client should be referred. These are now completed for each experimental clinic.

4.6.1.4. Initiation of antenatal care at pregnancy confirmation

The gestational age at first visit indicates if women are provided with the first visit earlier in pregnancy. The gestational age at first visit was added to the audit tool to measure how early women attend. The mean gestational age at first visit was calculated and submitted to t-test to assess for changes (see figure 4.2). The gestational age at first visit in the experimental group declined from a mean of 26.9 weeks at baseline to 24.2 weeks (P=0.001) in the second audit and to 23.01 weeks (P=0.00) in the third audit. In the audit and feedback group the gestational age declined from 26.7 weeks at baseline to 24.1 weeks (P=0.000) in the second audit, but in the third audit showed no change from baseline at 25.9 weeks (P=0.145).

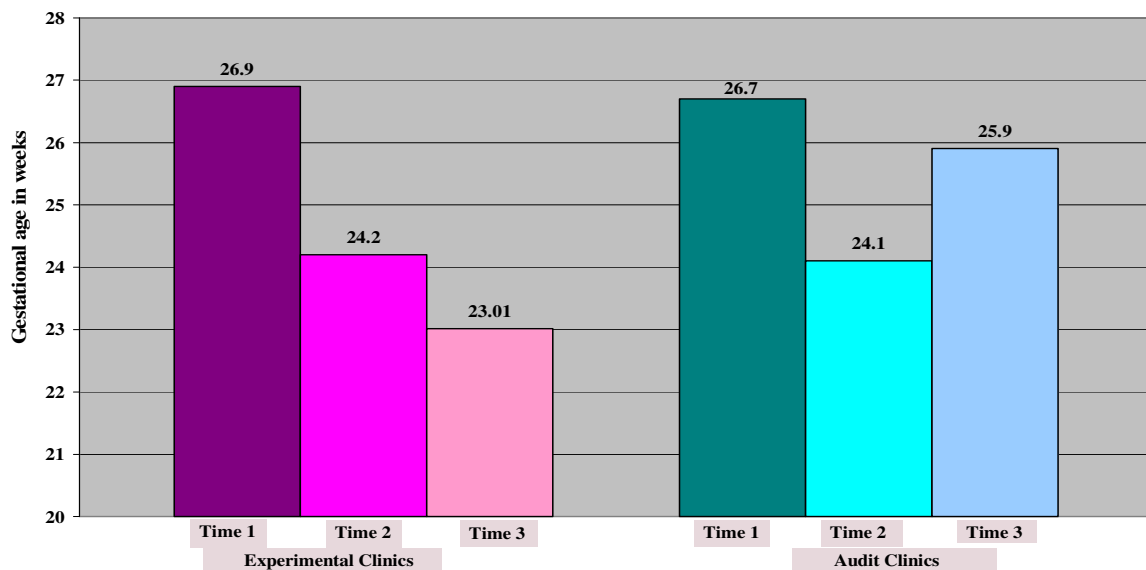


Figure 4.2: Comparison of mean gestational age at first antenatal visit for the experimental group and the audit and feedback group, at baseline (June), November and February audit.

The change in the experimental group shows that women are seen earlier in pregnancy for the first antenatal visit. The continuous decline shows that the clinic organization has changed allowing for women who has a pregnancy confirmed to be provided with the first antenatal visit on the same day. The audit and feedback group did not undergo the organizational changes to sustain this change.

The above organizational changes are needed in a clinic before an improvement in quality of care is expected. In the following section the quality improvement results are given.

4.6.2. Results: Quality improvement of care measured by audit of antenatal cards

Improvement in the quality of care to pregnant women in this study was measured by a pre-designed audit tool. The audit results are given in the following section.

4.6.2.1. Total number of cards audited at baseline, first audit and second audit after intervention

A total number of 1179 antenatal cards were scored from the ten clinics included in the study. Table 4.4. reflects the total number of cards audited for the experimental group and the audit and feedback group at baseline, as well as for the first and second audit after implementation of the BANC package in the experimental group. For ease of reference the baseline audit (June 2005) will be referred to as Time 1, the first audit after intervention (November 2005) as Time 2 and the final audit (March 2006) as Time 3.

The target of 50 cards per clinic was not reached. The research assistants reported that women for follow-up visits did not all meet the inclusion criteria and research assistants could not be full time auditing at the ten clinics. No incidences were reported of women not giving consent. Clinics are clustered as experimental (Intervention of BANC training and implementation) and audit and feedback (audit with informal feedback) group when discussing results.

	Baseline Audit (June 2005) Time 1	First audit after intervention (November 2005) Time 2	Second audit after intervention (February 2006) Time 3	Total # cards audited
Experimental group	250	183	181	614
Audit and feedback group	212	173	180	565
Total # cards audited	462	356	361	1179

Table 4.3. Total number of antenatal cards audited

The clinic with the smallest number of cards audited scored 5 cards during the final audit and the clinic with the largest number of cards audited scored 63 cards in the second audit.

The baseline data will now be discussed.

4.6.2.2. Baseline data

The baseline scores of the ten clinics included in the study was compared applying t-test to the total mean scores between experimental and control groups. The scores per clinic pair are presented in table 4.2 below. The total maximum score is 25. The total mean score for the experimental group was 17.9 and for the audit and feedback group 16.4, a statistically significant difference with p value = 0.000.

Pair	Experimental Clinic Identified by number	Mean Total Score	Audit and Feedback Clinic Identified by number	Mean Total Score
Pair One	3	20.3	4	15.0
Pair Two	5	17.9	1	16.4
Pair Three	2	15.5	6	15.6
Pair Four	7	17.4	8	16.6
Pair Five	9	16.3	10	19.4
	Total Mean Score	17.94	Total Mean Score	16.14 (p=0.000)

Table: 4.4. Baseline comparison of total mean score per clinic pair between experimental and audit and feedback groups.

Different total mean scores were noted between the paired clinics. Clinic #3 from the experimental group scored the highest at 20.32 and Clinic# 2 the lowest at 15.56. Clinic # 3 is a dedicated antenatal clinic, similar to Clinic #1 and Clinic #4 from the control group, which both scored low at 16.45 and 15.08 respectively. In the control group Clinic #10 scored the highest and Clinic #4 scored the lowest. Clinic #10 is a large clinic providing services for 8 hours during the week. The Pair 1 was formed by pairing the highest scoring clinic (Clinic #3) and lowest scoring clinic (Clinic #4). Pairs 2 and 3 scored similarly at baseline. The baseline comparison of the total mean score between the experimental and the control group shows a significant difference between the two groups. This indicates that the clinics were providing a different level of quality of antenatal care before the intervention. The experimental clinics were providing a better quality of antenatal care at baseline. It further indicated that randomization of the clinics in the pairs did not work. The small sample size most likely further contributed to this finding. It is concluded that the statistically different score at baseline indicates that randomization of clinics was not effective, most likely attributable to the small sample size. In discussion of the results the pairs will not be compared but the total mean score of the experimental group will be compared with the total mean score of the control group.

4.6.2.3. Comparison of total mean score for experimental and audit and feedback groups over time

The total score includes the sum of all 25 criteria on the audit score sheet. The total mean score for the experimental group and the audit and feedback group is presented in graph 4.2. below. The experimental group improved significantly from 17.94 (Time 1) to 20.3 (Time 2) ($p=0.000$) and again to 21.2 (Time 3) ($p=0.000$). The audit and feedback group improved significantly from 16.1 (Time 1) to 18.4 (Time 2) ($p=0.000$) and then remained constant at 18.6 (Time 3).

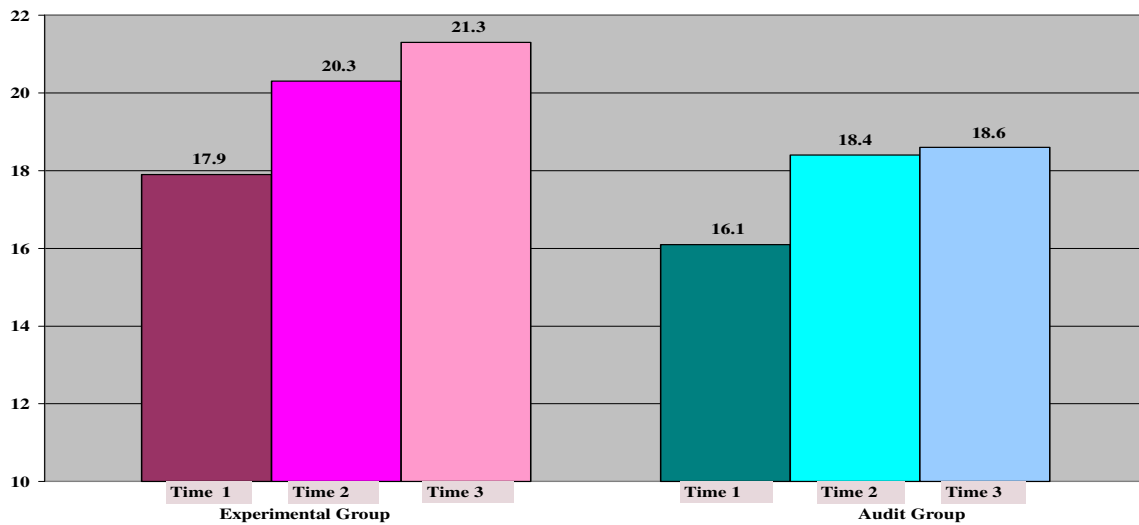


Figure 4.3: Comparison of total mean score for experimental and audit and feedback group of clinics over time.

The total mean score for the experimental group and the audit and feedback group is presented in graph 4.2. The total score in the experimental group continues to improve over time whereas the control group improved from first to second audit but then remained constant. The quality of antenatal care reflected by the audit tool improved in the experimental group at each of the audits. The improvement was small but significant and was sustained over the six month period. This improvement may partly be contributed to audit and feedback but the sustained improvement is more likely an improvement in the quality of antenatal care. The audit and feedback group of clinics started off with a lower score, showed a small significant improved in the second audit but then showed no further improvement at the final audit. The improvement at second audit is most likely attributable to an improvement in recording of basic errors corrected from audit and feedback rather than an improvement in quality of care. Audit and feedback has an effect, however this effect is probably not resulting from behaviour change leading to improvement in the quality of care provided.

4.6.2.4. Discussion of the effect of the intervention on each of the 25 criteria

The total mean score was calculated for each of the 25 criteria on the audit tool and submitted to statistical analysis. This allowed the researcher to compare and correlate changes for each of the criteria. In reviewing the results of the 25 criteria it is noted that a number of the criteria scored high at baseline audit. The audit score for these criteria indicated in Table 4.5. remained constant after the intervention. A number of criteria had an increased audit score in the audit and feedback group only as indicated in Table 4.5. This is interpreted as mainly the effect of better recording. A further number of criteria indicated in Table 4.5. had an increased audit score in both the experimental and the audit and feedback groups. Again this improved audit score may be related to the effect of the audit and feedback at clinic level. The number of criteria which had an increased audit score in the experimental group only as indicated in Table 4.5. related to criteria reflecting interpretation and decision making during the management of pregnant women. The area of care represented by these criteria is more difficult to improve and is unlikely to improve with audit alone. This effect is important as it indicates behaviour change leading to the improvement in the quality of care. The improvement was sustained over time, indicating that behaviour was integrated at clinic level in the experimental group of clinics. Criteria which improved with audit only over a short term were not sustainable over the longer term. This is further analyzed when discussing the three main categories. The effect of the intervention on the 25 criteria is summarized in table 4.5. below.

Effect	Criteria	Interpretation
No change	Age, parity and gravida History of previous pregnancy Previous illness Height/Weight Blood pressure at each visit Fetal heart and movement Urinalysis Tetanus toxoid given and recorded Return date for next visit Countersigning of 1 st and 36 th week visit	These criteria were already being done well and scored high in the pre-implementation audit Countersigning was not part of the practice in the antenatal care clinics and no change was noted during the implementation of BANC. This criterion is dependant on availability of staff.
Change in audit group only	History of present pregnancy Examination of the heart Syphilis test result recorded	All three criteria scored high in the experimental group and maintained a high score. Indicates that clinics are different Feedback from audit could account for improvement in the audit and feedback group.
Change in both groups	Plotting the SF height first visit Continuous correct plotting of SF Interpretation of the graph Haemoglobin and Rh grouping Counselling for HIV testing Transport	Effect of audit and feedback
Change in experimental group only	Expected date of delivery Fetal presentation recorded from 36 weeks Identification & recording of risk factors Action plan and intervention Discussion of labour with mother Future family planning	All criteria are related to decision making. Changed schedule of visits: staff repeatedly reported that more time is available to spend with patients and for discussion of labour and future contraceptive use.

Table 4.5: Comparison of total mean score for each of 25 criteria over time in the experimental group and the audit and feedback group.

Audit and feedback created an awareness of antenatal care as a programme. Audit highlighted issues related to antenatal care which has received little or no attention in comparison to programmes like HIV/AIDS and tuberculosis. Overall audit and feedback resulted in the improvement of basic actions and better recording. The intervention that is the training and implementation of the BANC Package, resulted in improvement of basic actions but also improved interpretation and decision making based on the history and examination of the pregnant woman. Interpretation and decision making is the area where improvement may impact on the outcome of a pregnancy. This will be discussed further when considering results of interpretation and decision making.

4.6.2.5. Comparison of total mean score of the three main categories for the experimental group and the audit and feedback group over time

The 25 criteria on the score sheet are divided into three main categories namely history, examination, and interpretation and decision making as summarized in Figure 3.1. in Chapter Three. The criteria were grouped in these main categories and the mean total score calculated for the experimental and audit and feedback groups. The total mean score was then submitted to statistical analysis for comparison and correlation. The results of comparing the total mean score between the experimental and audit and feedback groups for each category are described below.

- **History**

The History section combines all criteria related to the medical and obstetric history of the pregnant women with a total possible score of 6. In the experimental group the history score improved significantly from 4.95 (Time 1) to 5.26 (Time 2) ($p=0.0004$) and again to 5.6 (Time 3) ($p= 0$). The audit and feedback group also increased significantly from 4.81(Time 1) to 5.3 (Time 2) ($p=0.00$) and then remained constant at 5.2 (Time 3). Both

groups scored high in the history section at the onset of the study and both groups improved significantly from baseline to second audit, most likely as a result of better recording and correction of basic errors.

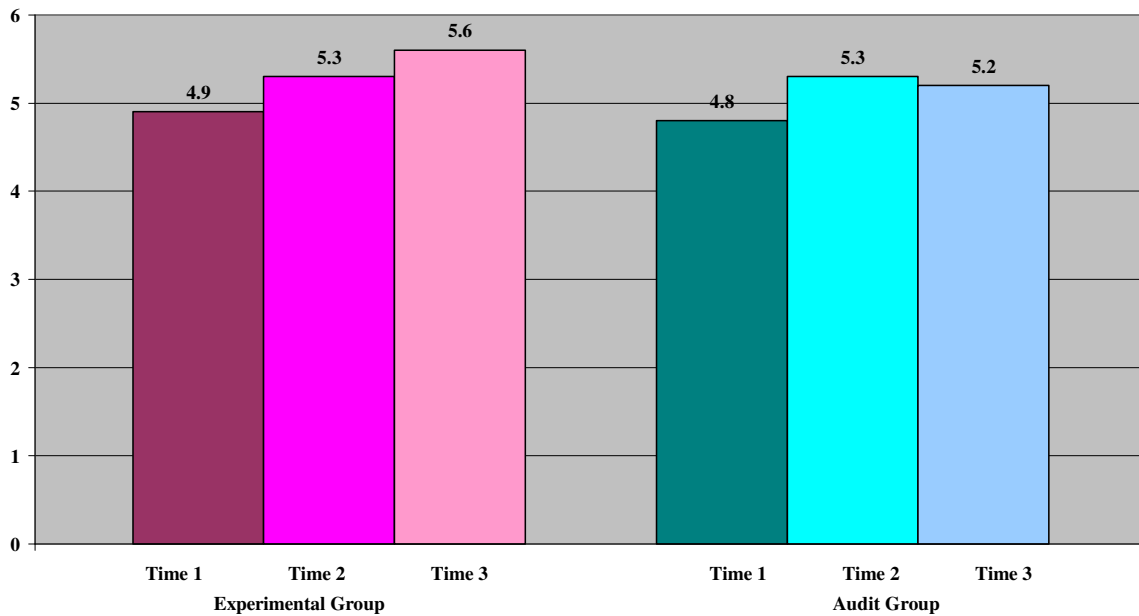


Figure 4.4. Comparison of total mean score for history for the experimental group and audit and feedback group over time.

On average the score for history was 5 out of a possible 6 for both groups. The one criterion where the scores were consistently low was the Expected date of delivery (EDD). It was found that professional nurses at primary health care level did not see the urgency to make every effort to calculate the EDD at the first visit, nor do they feel competent to determine the EDD. Once determined the date is then not recorded, particularly on the graph. The graph has an allocated space for recording the date as well as to indicate the method used to determine the EDD. The method used for determination must also be indicated namely dates, symphysis fundal height or sonar, or a combination of methods. During audit training it was found that the clinics do not have gestational age calendars (pregnancy wheels) available to assist in this process. Gestational age calendars were provided to all research assistants and to all experimental clinics. The continued improvement in the experimental group relates to the improvement in the calculation of

the EDD and improvement in the first plot on the graph of symphysis fundal height measuring fetal growth.

- **Examination**

The Examination section combines criteria related to physical examination and special tests required to monitor the pregnant women, with a total possible score of 12. The experimental group scored higher in the pre-implementation audit with 9.3 (Time 1) compared to the audit and feedback group which scored 7.79 (Time 1). The examination score in the experimental group increased significantly from 9.32 (Time 1) to 10.3 (Time 2) ($p=0$) and then remained constant at 10.6 (Time 3). In the audit and feedback group the examination score improved significantly from a baseline of 7.79 (Time 1) to 9.1 (Time 2) ($p=0$) and then remained constant at 9.3 (Time 3). In general the vital signs and examinations are routinely done and recorded at clinics. Audit with feedback improved the awareness of recording these on the antenatal card which most likely contributed to the improvement.

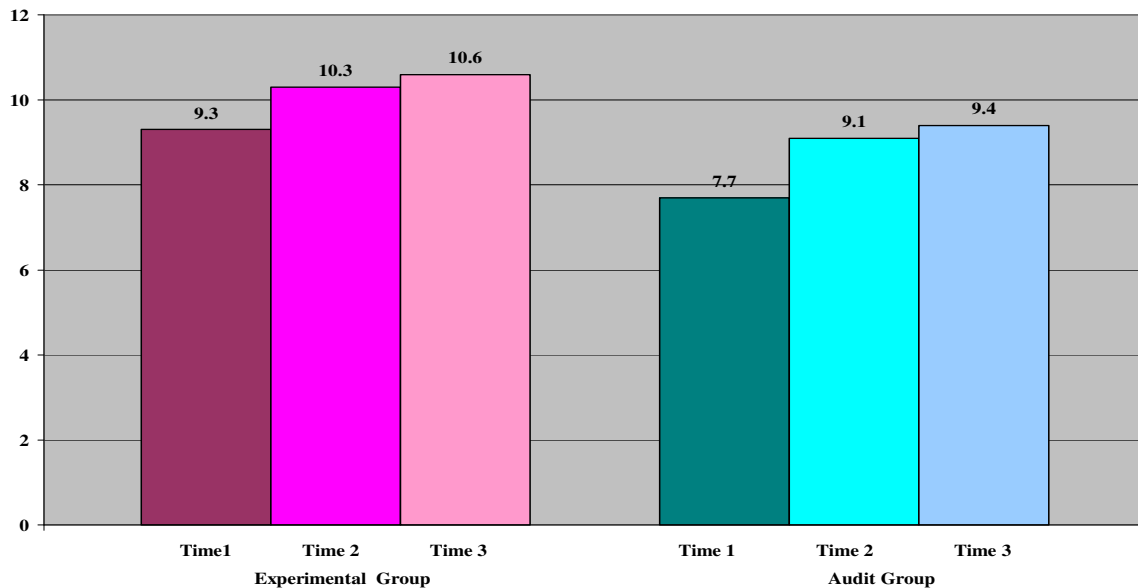


Figure 4.5: Comparison of total mean score for examination for the experimental group and the audit and feedback group over time.

Although the experimental group scored higher than the audit and feedback group at baseline, both groups measured a significant improvement at second audit and remained constant at the third audit. The scores achieved reflect the basic observations and vital signs of the pregnant women during antenatal care. These are routinely done. The increase in score is most likely attributed to the improved awareness of better recording of these observations. The area which improved with more difficulty is the criteria on the plotting and interpretation of the graph. On several occasions during the study, over and above the training sessions, participants from the experimental clinics approached the researcher to review the plotting and interpretation of the graph. For meaningful interpretation and assessment of the growth of the fetus it is essential that this section is done correctly with understanding of how to interpret the findings. Based on this interpretation a pregnant woman may be referred for post maturity or intra-uterine growth restriction, both being contributory factors to perinatal death.

- **Interpretation and decision making**

This section reflects combined criteria related to the interpretation of previously collected information and the decisions taken on the interpretation of this information. This section is critical as it impacts on the way the pregnant woman is managed. The total possible score is 7. The mean baseline score for the experimental and audit and feedback groups were the same at 3.7. The mean score improved significantly in the experimental group from 3.73 (Time 1) to 4.77 (Time 2) ($p=0.000$) and again to 5.11 (Time 3) ($p=0.000$). In the audit and feedback group the score increased from a mean of 3.7 (Time 1) to 4.02 (Time 2) ($p=0.000$) and then remained constant at 3.8 (Time 3).

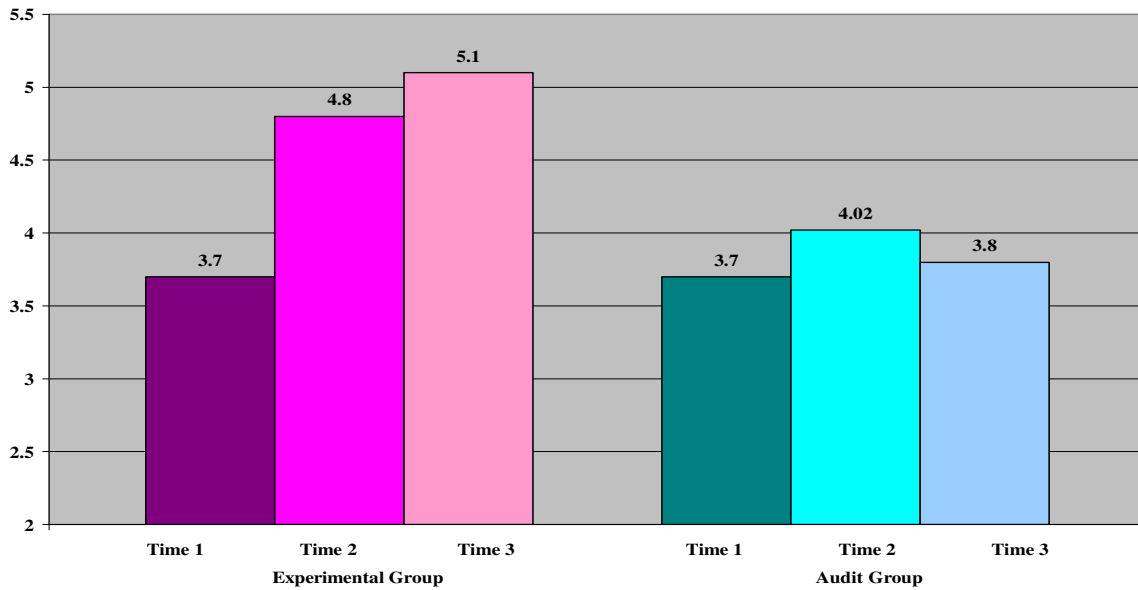


Figure 4.6: Comparison of total mean score for interpretation and decisions for the experimental and control clinics over time.

Interpretation and decision making is further explored per clinic over time. The results are given in Table 4.5 and further illustrated in Figure 4.4. In four of the five experimental clinics a significant improvement was measured over time. In four of the five audit and feedback clinics no improvement was measured.

	Clinic Number	Time 1	Time 2	Time 3
Experimental Group	2	3.53	3.2	4.15
	3	3.8	4.9	5.8
	5	3.6	5.05	2.4
	7	3.66	4.9	5.4
	9	4.03	3.5	5.1
Audit & Feedback Group	8	2.6	3.96	2.8
	6	4.2	5.03	2.4
	4	3.4	3.8	4.12
	1	3.68	3.5	3.38
	10	4.88	4.07	4.8

Table 4.6. Comparison of total mean score for Interpretation and Decisions per clinic over time.

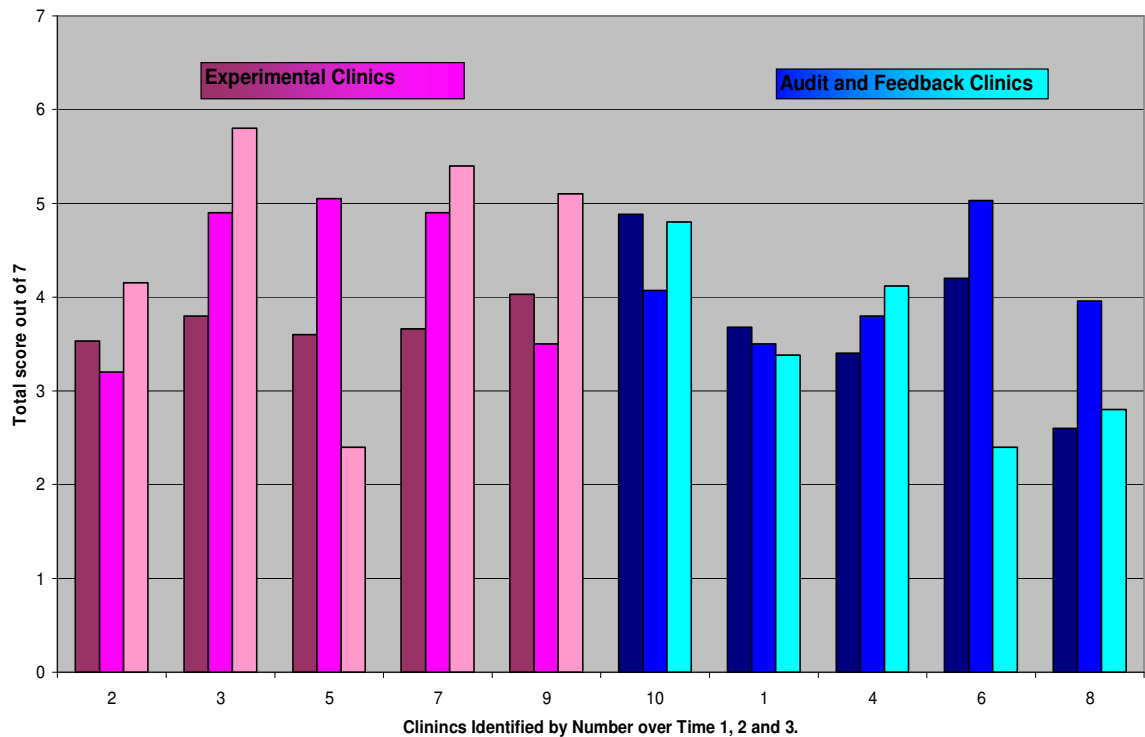


Figure 4.7: Comparison of total mean score for Interpretation and Decisions per clinic over time.

The score for ‘interpretation and decision’ at 50% was lower at baseline than the scores for ‘history’ at $\geq 80\%$ and ‘examination’ at $\geq 65\%$. ‘Interpretation and decision making’ is perceived to be more difficult to improve than merely improved recording as it requires behaviour change. The one criterion which was still poorly done in this section for both the experimental and control clinics were obtaining a second signature at the first and 32 week visits. The professional nurses understood the principle of peer review but thought it would be very time consuming for a second professional nurse to review and check what was done by her colleague.

An improvement in interpretation and decision making demonstrates an improvement in better management of the pregnant woman. In four of the five experimental clinics a significant improvement was measured for ‘interpretation and decisions’. In the audit and

feedback group four clinics did not improve with a decline measured in two clinics over time. Clinic No.5 in the experimental group showed a decline in score. Clinic No.5 with a decline in score experienced structural, logistical and managerial problems. The trainer was rotated out of the antenatal clinic before completion of her training. This meant that training of professional nurses working at this clinic also stopped. Clinic No.4 showed an increase in score even though the BANC package was not implemented. Of interest is that a newly qualified advanced midwife was appointed to act as sister in charge of the unit for most of 2005 and then appointed to the position in early 2006. During the time of the study she worked hard to bring staff under her supervision up to date with the latest midwifery information and introduced volunteers and birth companions to the unit. Her enthusiasm and actions could explain the improvement measured.

4.7. Interpretation and Discussion of Results

In this section the researcher will discuss the interpretation of the data.

4.7.1. Organizational Changes with Implementation of the BANC package

Changing the system of how antenatal care is organized at clinic level is necessary before it is expected that the quality of antenatal care as determined by auditing antenatal cards, will improve. These organizational changes are now discussed.

4.7.1.1. Implementation of the clinic retained checklist supporting the new WHO schedule of visits

The introduction of the checklist assisted the implementation of the new WHO schedule of visits. This resulted in a review of all the records being used to record the care of pregnant women at the experimental clinics.

The clinic retained checklist was introduced in all experimental clinics. It assisted the primary health care nurses to classify the pregnant woman at the first visit to establish

whether she qualifies for basic antenatal care (BANC). Used together with the patient retained antenatal record, it served as a reminder for all the necessary activities for the particular antenatal visit to be completed. In follow-up visits it assisted the primary health care nurses to identify risk factors. The checklist was well received and well liked by the primary health care nurses. It assisted them to identify risks and more importantly to prompt action when a risk factor was identified.

Implementation of the checklist highlighted other issues related to the system of documentation of patient care. The local authority clinics (municipal clinics) were using a form called the 'observation form' for pregnant women. This form had a table for recording the observations but did not have a graph to plot the symphysis fundal height measurement. It was found that this card was no longer needed and it was recommended that it no longer be used, but replaced by the clinic retained checklist.

Issues were also identified with the use of the Eastern Cape patient retained antenatal card which was used by all clinics, both local authority and provincial department of health clinics. It was found that not all clinics have the card available and even if it was available a constant supply was a problem. The National Maternity Guidelines (Department of Health, 2002:18) states that *'all women that attend antenatal care should be issued with an antenatal card. This is the principal record of the pregnancy and it should be completed at each antenatal visit and retained by the mother until delivery, after which it will be kept at the place of confinement or final referral. It is not necessary for antenatal clinics to keep a duplicate record of the card. Only a record of attendance, with results of special investigations, should be kept at the antenatal clinic'*. Traditionally it was the financial responsibility of the Department of Health at the nearest referral hospital to supply the antenatal cards to all primary health care clinics. This card would be retained and incorporated into the hospital records of the patient, therefore the hospital carried the financial responsibility of having the cards printed. With the separation of hospital services and primary health care into separate directorates, hospitals no longer accepted this responsibility and the primary health care clinics had to take up this financial responsibility of having the cards printed. This apparently contributed to the

perception that the provincial Department of Health is responsible for the financial burden of providing the cards even to the local government clinics. For the study period the researcher provided sufficient numbers of antenatal cards to the study clinics. The issue of availability was reported to all relevant managers, not only of clinics included in the study, as this was not a particular focus of the study. The antenatal card has since been made available to all clinics in the NMBM.

The recording and filing of the special investigation results was done in different ways in the different clinics. It was mutually agreed amongst the study clinics to attach investigation results to the checklist, which stays at the clinics, and to record the result on the patient retained antenatal card. HIV results would be recorded according to the coding system in use for the prevention of mother to child programme. No defaulter tracing system was in place at any of the clinics involved in the study. Where the checklist is filed according to months of the year, it was found that it may also be used as a defaulter tracing system. Only one clinic in the control group had a formal antenatal care register which had been in use over an extended period of time. The use of registers for antenatal care was not addressed in this study.

The new WHO schedule of visits was implemented in all the experimental clinics. The checklist assisted to structure the clinic visits according to the new WHO schedule of visits. The implementation of the WHO schedule of visits initially met with reservations and some resistance from the primary health care nurses. The concern was raised that pregnant women may develop risk factors or conditions detrimental to their own health or the health of the fetus, if not seen for six weeks. The SANC Regulation No: 2488 (1990, Paragraph 6(2)) outlining the visit schedule for midwives, was often mentioned as the main concern. The perception was that something will go wrong with the pregnant woman if not seen for all the visits as set out in the SANC schedule. At no point did any of the primary health care nurses referred to the schedule according to the National Maternity Guidelines (Department of Health, 2002:26), which is the formal policy of the National Department of Health. The WHO schedule was new information for the primary health care nurses and clinic #7 took longer than the others to change. Staff experienced

conflict between what they perceive as the highest authority in prescribing nursing practice (SANC) and new evidence not yet integrated into the SANC regulations. Several discussions were needed to address all concerns. The literature on the WHO randomized control study (Villar & Bergsjö, 2002:7) was shared with the trainers of trainees and the Head of Department (Obstetrics and Gynaecology) of the referral hospital. Providing sufficient information to all professional nurses and to pregnant woman, and with support from the researcher the change to the new schedule was made in all five experimental clinics.

4.7.1.2. Development of clinic specific protocols for patient management

The development of protocols was not an easy process. In the group of five trainers all had different levels of expertise and knowledge of antenatal care with little exposure to new developments. The advantage of the small group was that a trust relationship developed quickly between participants. If a participant had a specific area of a protocol where she did not know what to do she asked for assistance and support from other group members. This could then be discussed, the literature consulted and an agreement reached on the steps and the content of the newly developed protocol. Where no agreement could be reached on a specific issue it was referred to the Head of Department (Obstetrics and Gynaecology) of the referral hospital. It was difficult for the researcher to determine to what extent other staff at clinic level was consulted in the process. On completion of all protocols a set from one clinic was typed up as a 'prototype' which was presented to the Head of Department (Obstetrics and Gynaecology) of the referral hospital for critical reading and approval. Much effort was put into the completion of protocols which included negotiations and approval of the referral hospital. Developing the clinic specific protocols required primary health care nurses to engage in reading and discussion of current practice of antenatal care. This increased awareness of new evidence for practice and had an impact on defining and revising referral routes. Once protocols were completed it was seen as a valuable tool and resource in the management and care of the pregnant women.

4.7.1.3. Defining and revising referral routes and criteria

A document to address referrals existed in the Nelson Mandela Bay Metropole listing the conditions for which a referral of the pregnant woman was indicated. This did not provide the detail needed to guide the primary health care nurses in management of the patient at clinic level. The list contained diagnosis and not the symptoms, whereas BANC is based on a syndromic approach to classify pregnant women. Each of the clinic specific protocols has its own 'referral' component. This assisted the trainers and clinics to clarify referral routes and to identify who the contact person would be for such a referral. During protocol development the referrals were discussed with the referral hospital.

4.7.1.4. Initiation of antenatal care at pregnancy confirmation

The initiation of the first antenatal visit at pregnancy confirmation involved cooperation from all clinic staff and a re-arrangement of how the clinic is managed. It was necessary to adapt to the idea of seeing a pregnant women immediately, for a formal antenatal assessment when it was determined that she is pregnant. The clinic practice of re-booking first visits, without an assessment of the patient on the day pregnancy was confirmed, for the clinic day for pregnant women had to change. Initially with the change to provide the first visit when the pregnancy was confirmed the trainers of trainees reported an increase in workload. At this first visit the checklist had to be started with all activities recorded on the antenatal card checked against it. This included an assessment of whether the pregnancy is planned to offer termination of pregnancy; counseling for HIV (opt out approach); on-site testing for HIV; investigations related to pregnancy and appropriate further management based on findings. A complete history and examination must be completed and particular emphasis is placed on the calculation and determination of the expected date of delivery. The clinics reported an increased number of patients seen for a period of two to three months, before the patient numbers stabilized, and started to decline. Staff was reluctant to let go of the practice of seeing patients for first visits once

a week on a designated day. The support from the researcher and the clinic manager was very important during this change process. A period of three to four months was needed to integrate the new practice. The implementation of this practice happened together with and was supported by the implementation of the reduced schedule of visits.

4.7.2. Quality improvement of care measured by the scoring of antenatal cards

The results for the audit score on the quality improvement of antenatal care are given in section 4.4.2 of this chapter. A small but significant increase in score was noted in the experimental and the audit and feedback groups on the total mean score of all 25 criteria, most likely attributable to better recording on the antenatal card. Similarly a significant increase in mean score of the two main categories 'History' and 'Examination' was found. Important aspects of these sections are the correct determination of the expected date of delivery and the correct continuous plotting of the symphysis fundal height on the graph on the antenatal card. The graph on the antenatal card has particular significance in that it demonstrates growth of the unborn baby. During the study it was noted that many primary health care nurses are not competent to correctly plot the symphysis fundal height on the graph. Should this not be done no meaningful interpretation of the graph can be given. The plotting on the graph starts with the calculation of the expected date of delivery. Correct calculation of the expected date of delivery and correct plotting is crucial for the diagnosis and management of IUGR and post maturity.

For the 'Interpretation and decision' section the baseline scores for the experimental and audit and feedback group was the same, indicating no differences in management of the pregnant women between the groups at the onset of the study. A significant sustained improvement in the experimental group, further illustrated by the comparison of individual clinics, can be seen as a behaviour change in the professional nurses with better management and referral of the pregnant woman. The decline in score for the section 'Interpretation and decision' over time for the audit and feedback group shows that the effect of audit is reduced over time, and no change was noted in the way professional nurses managed the pregnant woman.

Managerial problems at a clinic may hamper the effective training and implementation of the BANC Package as was seen in Clinic No.5. where a decline was measured in the quality of antenatal care over time. A clinic manager with a special interest and expert knowledge may influence the quality of antenatal care provided as seen in Clinic No.4. where a continuous increase in score was measured, even though the BANC Package was not implemented.

Audit and feedback improved the awareness of correct and complete documentation, and improved recording of basic actions. The implementation of the BANC Package improved basic actions but more importantly improved the ‘Interpretation and decision’ making. The improvement in interpretation and decision making illustrates the effect of BANC on the management of the patient. This could make a difference in quality of care, particularly the identification of risk factors in the pregnant woman. With improved interpretation and decision making related to these risk factors the implementation of the BANC Package may impact on the outcome of the pregnancy.

4.8. Effectiveness of the BANC package

Did the implementation of the BANC package improve the quality of antenatal care in the experimental clinics?

In order to assess the effect of the experiment it was necessary to adjust for the differences in scores between clinics and the difference in scores in the audit group at baseline (Time 1) and final audit period (Time 3). A fixed effects ANOVA model was used as presented in table 4.6 below. The variables tested were for the audit, the clinics and the experiment.

Variables tested	Total Score	Critical Criteria	Examination Score	Modified Score	Symphysis Fundal Plot	History Score	Interpretation and Decisions score
Audits	0.000	.000	.000	.000	.000	.000	.000
Clinic	0.000	.000	.000	.000	.000	.000	.000
Experiment / Audit	0.584	.483	.139	.660	.290	.184	.792

Table 4.7. Univariate ANOVA – fixed effects model to compare the experimental group and the audit and feedback group for variables.

The p values for experimental clinics are not significant for any of the variables tested against audit, clinics and intervention. It cannot be concluded that the improvement in audit scores reflected an improvement in the quality of care as a result of the implementation of the BANC package.

4.8.1. Possible biases which could influence the study results

The purpose of a study design is to set up a situation that maximizes the possibilities of obtaining valid answers to research questions (Burns & Grove, 2005:228). Measures to achieve this for this study were described in Chapter Three. However some findings need to be reported on that may have an effect on the findings of this study.

- Baseline differences between clinics: At baseline the experimental clinics scored significantly higher than the control clinics, indicating a lack of equivalence between the experimental and audit and feedback group.
- Small number of clinics: Ten clinics were included in the study, with five clinics each in the experimental and audit and feedback groups. This relatively small number may have contributed to the differences measured at baseline.
- Audit and feedback had an effect. The training in auditing clinic cards that research assistants from all ten clinics received may have had an effect on some of the improvements measured.

4.8.2. Summary

A brief summary of the findings is listed below:

- The implementation of the BANC package contributed to pregnant women being seen earlier for the first visit
- With the organizational changes advocated with the implementation of the BANC package in place, the organizational platform was established for improvement of quality of care to pregnant women
- The significant improvements measured in the ‘history’ and ‘examination’ sections may be contributed to the effect of audit with feedback.
- The baseline scores for both the experimental group and the audit and feedback group showed no difference for ‘Interpretation and decision making’. In the experimental group the significant continuous improvement noted in ‘Interpretation and decision making’ section is positive and may impact on pregnancy outcomes.
- The new WHO schedule of visits decreased the number of clients attending at primary health care clinics enabling professional nurses to spend more time on patient assessment, education and preparation for the birthing event.
- The new WHO schedule of visits was perceived as conflicting with SANC rule and has to be addressed
- The dilution effect of the trainers of trainees approach should be considered and support systems identified to minimize the effect
- Support and supervision from managers was essential, even critical to facilitate organizational changes to enable BANC training and implementation; and again was needed for sustainability
- The effect of the BANC package on the perinatal mortality and in particular on stillbirth rate, cannot yet be assessed. Before a difference is expected more clinics in the Nelson Mandela Bay Metropole need to be involved over a longer period of time.

4.9. Conclusion

The BANC programme resulted in a significant improvement in 'interpretation and decision making' and empowered clinics to comply with national maternal care requirements. Clinic specific protocols facilitated exposure to new evidence and assisted professional nurses with decision making and referral. Audit with feedback alone had a small effect to improve audit scores reflecting quality of care. The unexpectedly low increase in antenatal score in the experimental group could be due to the inherent weaknesses of trainer of trainer methodology, mainly the dilutional effect at each level and conditions at clinic level. The involvement of managers for support in implementation and sustainability is crucial for the BANC quality improvement package.

5.1. Introduction

The objective for implementation of the BANC package was to improve the quality of antenatal care as measured by a pre-designed audit tool. The quantitative results of the audit three months after the implementation (retest one) showed a small improvement in quality measured in the intervention group and also showed an improvement in quality in the audit only group. The need was identified to understand the findings of the quantitative section of the study. A qualitative section was added to understand experiences of individuals involved with the implementation of the BANC package. In Chapter Three a description was given of the qualitative research design and method. In this chapter the discussion will focus on the results obtained from the focus group and individual interviews. Themes and sub-themes were identified and will be supported by relevant quotations from the transcribed interviews with verification done by means of literature control.

5.2. Research Findings

Qualitative research is a form of social inquiry that focuses on the way people interpret and make sense of their experiences and the world in which they live (Holloway & Wheeler, 2004:3). The qualitative methodology was best suited to obtain insight and understanding of the participants' experiences of the implementation of the Basic Antenatal Care package.

Focus group and individual interviews were used for data collection. The focus group interview was facilitated by an independent facilitator. The participants were the group of trainers trained by the researcher. The independent facilitator provided the opportunity

for the trainers to feel at ease and talk freely. The duration of the focus group discussion was approximately ninety minutes and was attended by four of the five trainers of trainees. All four were female professional nurses with ages between 24 and 64. One trainer was in charge of a midwife obstetric unit, two worked in the antenatal clinic (one absent for interview) and two were in supervisory positions for primary health care clinics. The questions developed to elicit the required information were:

- *How did you experience your own training in the Basic Antenatal Care Package?*
- *How did you experience training other people in the Basic Antenatal Care Package?*

No pilot study could be done as there were only 5 possible participants. Questions were discussed with experts. The facilitator was a psychiatric nurse well versed in group interviewing skills.

The participants for the individual interviews were the managers and primary health care professional nurses linked to the clinics where the BANC package was implemented and who received the training. The individual interviews were done to understand experiences of these participants and were done by the researcher. Participants were selected purposively, targeting one manager and one primary health care professional nurse per clinic where the BANC package was implemented. The first individual interview was taken as the pilot study. It provided the opportunity to reflect on whether the question posed elicited relevant data and provided the researcher the opportunity to reflect on interview skills. As the first interview was successful it was included in the study. Eight individual interviews were done which lasted between 20 and 40 minutes. Participants included three managers of primary health care clinics and five primary health care professional nurses working at clinics where the BANC package was implemented. All participants were female and ranged in age between 25 and 62 years. The interview question asked was:

- *How did you experience the implementation and training of the basic antenatal care package in your clinic?*

One interview at clinic level was experienced as particularly difficult by the researcher in that the researcher did not succeed in putting the interviewee at ease. This resulted in the participant not talking freely and not providing a detailed description. This interview was done in a client consulting room for privacy, which had a telephone that kept interrupting the interview process. The interview was discarded and not used in data analysis. One other interview was terminated at the start as the interviewee was informed during the interview of bereavement. Data for analysis was used from six individual interviews. The focus group and individual interviews are reported simultaneously as the themes that emerged were very similar.

The focus group and individual interviews were taped to assist the researcher to record the data collected. The taped interviews were transcribed and together with the field notes typed and prepared for analysis. Data were analysed according to Tesch's guidelines (in Creswell, 1994:154-155). On completion of analysis and identification of themes an independent coder was consulted. Consensus discussion between the researcher and the independent coder was done until agreement on themes and sub themes were reached. The main and sub-themes are listed in table 5.1 below and will now be discussed and supported with direct quotations and literature control.

Themes	Sub-themes
Staff felt positive about the training	<ul style="list-style-type: none"> • The training materials were useful for training and implementation in practice • The staff experienced improved self-esteem and confidence • The master trainer was viewed in a positive light
Acting as a trainer was experienced as difficult	<ul style="list-style-type: none"> • Conflict existed between original training and the new approach • Staff verbalised differing levels of need and interest in the training • Trainers did not receive adequate support at clinic level to implement the training of their colleagues • Staff need supervision for effective implementation in practice
The new approach holds benefits and challenges for service provision	<ul style="list-style-type: none"> • Primary health care professional nurses were not able to focus exclusively on antenatal care • Implementing the training in the clinics was described as problematic • A procedure of staff rotation was applied to address issues of staff shortages • Managers could describe the purpose and process of BANC principles but are vague on utilization in practice • Managers had insufficient knowledge to effectively monitor implementation • The BANC tools assisted primary health care nurses to provide better quality of care • Primary health care professional nurses had more time for other tasks related to the care of pregnant women

Table 5.1. Themes identified in the experiences of individuals involved in the training and implementation of the BANC package.

5.2.1. Main Theme One: Staff felt positive about the training

The training was presented in five two hour sessions held in five consecutive weeks on Friday afternoons. Training sessions started at 1200 and continued until the objectives for the session was completed. Although planned as a two hour session it continued beyond

three hours for most Fridays to cover the content of the session. The master trainer (researcher) guided the training of the participants, but sharing information and expertise from the different members to enrich the training happened with ease in the small group. All group members took part in the discussion of the protocols for client management. Further examples on practical skills were that an experienced midwife could demonstrate plotting of symphysis fundal height on the graph, while another could demonstrate the rapid HIV test and so on. Dialogue on the more theoretical part was ongoing to identify what current practice was and what new evidence and findings is that should be implemented. The trainers enjoyed the exposure to new information with the emphasis on antenatal care. As it was a small group of five primary health care professional nurses they got to know each other well over the period of training and could freely share ideas and ask questions when not sure. It was evident that the participants experienced the training as positive thus expressed:

“(From my background) I’ve got a lot more pure midwifery experience...I found the (BANC) training was quite comprehensive”

On completion of each session the trainers had to return to their own clinics and train primary health care nurses at clinic level, in a similar manner, therefore cascading the training to colleagues. In supporting the principle of cascade training two examples of the successful use of cascade training is referred to. The first project by Bax (2002:165-177) occurred in teachers training where cascade training was used to train many teachers in a relatively cheap way, relatively quickly. In the second study, a randomized control trial of prescribing training in a South African province Meyer, Summers & Möller (2001:833-840) describe the effective use of the cascade training model. The positive results from these studies provided evidence that qualified teachers or professional trainers are not needed, as the professionals who conducted the training successfully had never trained others before.

Further to the main theme three sub themes were identified listed below:

- The training materials were useful for training and implementation in practice
- The staff experienced improved self-esteem/confidence
- The master trainer was viewed in a positive light

These sub themes will now be discussed.

5.2.1.1. Sub Theme 1.1. The training materials were useful for training and implementation in practice

The training material was found useful for the training and implementation in practice. The BANC package contains all the material needed to train professional nurses at primary health care level. It was necessary to orientate and familiarise participants with the content, training principles and training process required.

The following quotes illustrate that the training material were useful and well liked by the participants.

“The checklist particularly, gives you something to work from.”

“I like the guidelines (flow charts) that we use to set up the protocols; ...they have very clear differentiation between what is normal and what is abnormal...”

“I think the training material was successful...one of the big things was the protocols... it's actually focused us, it's made us more aware of the important facets in pregnancy.”

The total content of the BANC package is put together in a cardboard box for easy storage and handling. The booklets all have the same cover outlay with a graphic design presenting a mother and baby. It took some time for participants to differentiate between the different booklets. Each participant was encouraged to write their name on each booklet to prevent the materials from mixing up as it was often all spread out on the table.

During the training sessions the researcher frequently referred to the training material to familiarize participants with what is in the package and how it could be applied and used for training at clinic level. Participants were encouraged to bring their clinic's copy of the Guidelines for Maternity Care in South Africa (Department of Health, 2002: 1-140) and the Standard Treatment Guidelines: Essential Drug List (Department of Health, 2003:1-364) to the training sessions as it was not included as part of the package.

Using the facilitators guide, the researcher used the BANC package content to direct the group of trainers through the learning experiences and tasks designed and incorporated in the BANC package. A learning task is a task for the learner, based on an open question, accompanied by the resources learners need to respond to the implied open question (Gravett, 2001:57). Learning tasks serve as mediational tools within a dialogic teaching strategy and they structure the dialogue with learners. Thus a learning task is not merely an activity for learners, but the backbone of the dialogic teaching process, as the expected learning is encapsulated in the tasks. Learning tasks thus include the learning content as well as the actions by learners to assimilate the content (Gravett, 2001:58). The content can be presented to the learners via a lecture, video clip, demonstration, slide show, an article which all participants in the programme read, an excerpt from a textbook, an outline, a model, story, case study and so forth. The difference between presenting content as it is done traditionally and how it is done via learning tasks call upon learners to interact with the content immediately. Gravett (2001:62) describes the procedure for implementing learning tasks in educational sessions:

- Put the task to the learners either on overhead projector or handout. Read the task and ask "Is the task clear?"
- Specify the time at which they must have completed the task depending on the complexity of the task
- The learners then work on the task, either individually or more often in small learning teams.
- Once learners have completed the task, elicit responses from some of the teams, or all the teams, depending on the number of learners. One's role as

educator is then to welcome, correct and confirm their responses and to add one's experience and knowledge to their findings

- This is followed by inviting sharing in the large group, thereby allowing any learner who wishes to contribute to do so.
- The last step before moving to the next learning task, is to summarise the task
- Now move on the next learning task (Gravett, 2001:62).

An example from the BANC package is the session on protocol development. A presentation is done by the master trainer presenting the theory related to the topic. The relevant material is then referred to, to clearly spell out the task. Often a question or two from the group would clarify any parts that are unclear. Time is then allowed for learners in the group to work on the task. On completion of the task a person from the group was requested to share ideas with others in the group. This often resulted in discussion which would continue until consensus was reached. This process was repeated for a few protocols, and then homework was given to complete protocols together with staff at clinic level. The training provided to the participants offered the opportunity for them to learn about new developments in antenatal care. It also prepared them to train professional nurses at clinic level.

The trainers experienced improved self-esteem and confidence discussed as the next sub theme.

5.2.1.2. Sub Theme 1.2. The staff experienced improved self-esteem and confidence

A different level of knowledge and expertise was represented in the group of trainers at the onset of the study. For example one participant was an experienced midwife more exposed to new information on antenatal care, while a clinic supervisor on the other hand, have not worked in antenatal care and were not exposed to new evidence since her basic training. The format and content of the training in the BANC package exposed the participants to the latest developments and new evidence in the provision of antenatal

care. The training received in the BANC package developed skills and confidence as illustrated in the quotes below:

“We feel good about what we are doing...”

“I have learnt a lot...I have developed my skills...and I feel confident...”

The BANC package contained *“activities intentionally designed for the purpose of bringing about learning among those whose age, social roles or self-perception define them as adults”* (Merriam and Brockett in Gravett, 2001: ix), a description which fits the target group for training namely primary health care professional nurses. The old adage that ‘you can’t teach an old dog new tricks’ haunts both teachers and adult learners themselves as they set forth on new learning ventures. This is a powerful myth, because the belief that adults lose their ability to learn as they age can impact negatively on adult learners and their teachers. Many adults who re-enter education indeed sometimes experience learning difficulties. These can often be ascribed to anxiety and lack of self confidence, resulting in the underestimation of their learning ability. (Gravett, 2001:1). Thus, educators can boost learners’ confidence by sharing with them research findings that ageing does not necessarily impact negatively on learning ability. Alerting the trainers to the principles of adult learning increases their own awareness of learning and provides information on how they should approach the training at clinic level. Adults prefer learning situations which:

- Are practical and problem centred
- Promote their positive self esteem
- Integrate new ideas with existing knowledge
- Show respect for the individual learner
- Capitalize on their experience
- Allow choice and self direction (Gravett,2001:1)

The principles of adult learning are incorporated into the BANC package. This most likely contributed to the positive way the participants experienced the training,

verbalising that they feel more confident about their practice and feel good about the training.

5.2.1.3. Sub Theme 1.3. The master trainer was viewed in a positive light

Educators play a paramount role in establishing and maintaining a cooperative affective–social climate (Gravett, 2001:37-45). They should create a climate in which learners experience safety, trust, acceptance, respect, support, connectedness and satisfaction. Meaningful learning requires that learners feel safe in the educational setting. The following can contribute to a feeling of safety:

- Trust in the competence of the educator
- Trust in the feasibility and relevance of the course purpose and outcomes.
- Allowing learners to find their voice in small groups
- Sequencing activities – start with clear relatively easy tasks before proceeding to complex and difficult ones
- Learning environment need to be non-judgemental
- Significant new learning requires us to move outside our comfort zone, but if too far outside our comfort zone we tend to withdraw or resist new learning
- Trainer (educator) should display enthusiasm
- Appropriate use of humour can contribute to a cooperative learning climate (Gravett, 2001:41).

The participants trained as trainers were a small group of five members. It was relatively easy for the group to get to know each other quickly; they had a common purpose and became comfortable in the group very quickly. The need for the training was accepted and agreed on by all members therefore a common goal was created for the group. During the focus group interview comments quoted here were made portraying the master trainer (researcher) in a positive light:

“I found that the trainer was very accessible if we wanted clarity about things. You know, we could phone her, we could talk to her...”

“Can I just add, I think she has a tremendous enthusiasm that just cures everybody in the department, I think because she really, truly believes in this.”

“what I can say about my trainer is that she was really persuasive...I had to set my priority to see that this is of importance, that I should also sacrifice ...”

“The trainer was very supportive throughout the training and really tried to, to guide us properly, so I, I think what we did, the training was good...”

Reflected in the comments perhaps is an achievement of building trust, including teacher credibility and authenticity in an attempt to create a cooperative learning climate. Hammond and Collins (cited in Gravett, 2001:45) describe this as follows: *“We want learners to know that we are with them; that we want to accompany them as they embark on a journey of discovery with us; and that we would like to be able to count on them to support us and others in the learning group during our shared journey.”* In this study the learners had a particular responsibility to become trainers but also change agents. In this respect they could emulate the actions of the master trainer and use her as a role model.

During the individual interviews participants did not comment about the trainers at clinic level. It was therefore not possible to get a sense of how they were perceived by the trainees at this level.

The role of the trainers is further discussed in the next main theme.

5.2.2. Main Theme 2. Acting as a trainer was experienced difficult

Participants experienced acting as a trainer as a difficult role to fulfil within the context of implementation of the BANC package at primary health care clinics. Implementation of the BANC package is an innovation to improve the quality of antenatal care services. The

trainers are therefore tasked with the dual role of trainer as well as change agent. Preparation for this role involved an update of new evidence on the practice of antenatal care and the integrated approach of the BANC package, but also included principles of adult learning and the process of cascade training. Other aspects inherent in this process were change management including problem solving and quality improvement.

The participants trained as trainers experienced problems to repeat the same training they received at clinic level. The demand of normal duties expected of the trainers created pressure to complete the activities related to implementation of the BANC package. Weekly training sessions for the trainers were held on a Friday afternoon which is seen as a quieter clinic day. Mondays to Thursdays are recognised as busy clinic days with large numbers of patients attending and often other issues related to clinic and staff management which need to be attended to. The trainer was then 'drawn in' to normal work routine and found it difficult to stick to the plan for training at her own clinic, which was to find a two hour time period to train others. The trainers were not relieved of any 'normal' duties. The one week allowed in between training sessions for the trainers themselves was not sufficient for cascading training and implementation at clinic level. The quote below explains:

“For me to do it at the clinic was a bit of a problem because I couldn't, for the same time that I was getting training, I couldn't take the same two hours and spend it at the clinic, especially as our training was on a Friday and you know the clinics are very busy during the week, so it was really squashing in the training sessions and I think that is actually detrimental to the whole thing, so it's as if I was always playing catch up, I was always a bit behind and I still feel like that in some respects.”

The cascading model, used in the BANC package, has been widely used as a means of reducing costs in in-service training and maximizing benefits in large scale training. Gilpin (1997) quoted by Bax (2002:165) offers a thorough and well-argued discussion of cascade projects in teacher education, describing it as '*a classic example of the process of*

educational change in which the participants are both the subjects and the agents of change'. Two South African examples of the successful use of cascade training is described, one by Bax (2002:165-177) in teachers training and another by Meyer, Summers & Möller (2001:833-840) in prescribing training in primary health care.

In the one project (Bax, 2002:165-177) the aim was for teachers who went to Britain to return to South Africa and set up 'cascade workshops' during which they would tutor colleagues who had not been to Britain. This project trained a record number of South African teachers and resulted in excellent official evaluations. However it was felt that the trainer training aspect of the project was relatively disappointing, particularly in the area of cascade workshops. Bax then explored reasons for this concluding that social and cultural aspects of cascade training contributed. For example a teacher would find it difficult to present the principal, seen as her superior, with new information as the principle was of higher rank and authority and presumed to have better knowledge. It would not be culturally correct to question the knowledge of a person in a superior position. Further information on trainer training from Bax (2002:172-173) indicates the concern on the 'watering down effect' of this approach and he quotes the following: "*It is as if at every level of the cascade there is a sieve and only a certain amount of what has been said sifts through so that by the time it reaches ground level - the classroom teacher - there is only a fraction of the original training*". Bax continues with a recommendation that trainers will need to be strong in methodology and technique, and must be aware of the range of social and cultural factors which may influence cascade training.

A disadvantage of cascade training is the possible dilution effect. Hubbard (2003:106) writes about cascade training and the circumstances where it can go wrong stating that the concept is simple and seductive. The manager says, "*Why should I send ten people to training? I'll just send Sammy, and when she comes back she can train everybody else.*" (Hubbard, 2003:106). He continues stating some of the circumstances where cascade training may go wrong:

- Hectic pace of work environment: The meeting in which the trainer has to train her colleagues never happen.

- The meeting may happen but ‘Joe is on vacation and Jennifer can’t make it’. So a significant portion of the trainees get no training whatsoever.
- This model assumes that the trainer assimilated 100% of the material presented. That is highly unlikely, an average person may retain 60% of the material at the first go-through
- This model assumes that the trainer is as good a trainer as the master trainer. Once again highly unlikely as the trainer has a different role with the training only a small added part to her job.
- The trainer may not have the training material, videos, dedicated training environment as the master trainer.
- Equal time as allowed for the trainer is seldom allowed at implementation level. Suppose the training for the trainer took eight hours, typically she will be given a shorter period to present her information to the trainees.

Considering the second study, a randomized control trial of prescribing training in a South African province Meyer, Summers & Möller (2001:837) describe the effective use of the ‘cascade training’ model. In this study the authors, considering the high level of expenditure on drugs, noted the restricted access to drugs often related to poor prescribing at primary health care level. The training of primary health care providers in effective prescribing was identified as a priority. Nursing staff were themselves trained to present training on prescribing. Significantly improved prescribing practices were found in the study group, compared with the control group. The training cascade was shown to be a very effective method to improve prescribing practices. The positive results of their study provided evidence that qualified teachers or professional trainers are not needed, as the people who conducted the training successfully had never trained others before.

Prescribing practice might be simpler and more focused than teaching English or Basic antenatal care. In considering the training approach the type of message might be of importance and the type of trainer may impact on this. Trainers have a challenging role and need to be selected with care and supported by management to successfully cascade

training to clinic level. The role of trainer as change agent will be further explored in the sub themes discussed below. The sub themes identified are the following:

- Conflict exists between original training and the new approach
- Trainers need to be specifically prepared for this role
- Staff verbalise differing levels of need and interest in the training
- Staff need supervision for effective implementation in practice

These will now be discussed.

5.2.2.1. Sub Theme 2.1. Conflict existed between original training and the new approach

Professional nurses, during formal training, are exposed to the role and functions of the South African Nursing Council. The Minister of National Health and Population Development has, on the recommendation of the South African Nursing Council, in terms of section 45(1)(q) of the Nursing Act, 1978 (Act No. 50 of 1978), made the regulations relating to the conditions under which Registered Midwives and Enrolled Midwives may carry on their profession. The regulations were gazetted as Government Notice R2488 of 26 October 1990. The South African Nursing Council in Government Notice R.2488 recommends the following on antenatal care in 6 (2) *“Where possible, the registered midwife shall visit the patient at least once a month until the 28th week, thereafter at least once a fortnight until the 36th week, and then at least once a week until commencement of labour.”* This could result in 12 visits during the antenatal period. The schedule is familiar to trained professional nurses and midwives.

The schedule of visits in the BANC programme is based on a WHO randomized trial (Villar & Bergsjø, 2002:10). The recommendation from this study is for the pregnant woman who qualifies for the basic component of antenatal care, to attend the clinic for antenatal care four times during her pregnancy at six week intervals at 20, 26, 32 and 38 weeks gestation.

In training at clinic level participants hesitated to implement the new schedule of visits and expressed their feelings of insecurity, despite the new evidence presented. They also found it difficult to convince their own trainees to change their approach. Participants reported that:

“they (the clinic staff) found it very difficult to let go of this seeing patients according to the Council (SANC) rule, I must admit I had some reservations myself...”

“I think there was only one problem that the sisters have; they were bombarding me with questions like, what the Council says, the Council rule says this and all...”

Fear that something would go wrong and the trainer would be blamed was also a factor to prevent immediate implementation of the six weeks follow-up visits. One sister expressed it as:

“I was actually very scared, initially”

The implementation of a changed schedule of visits is linked to the implementation of the checklist and providing the first visit assessment at confirmation of pregnancy. To achieve this successfully organizational change must take place at clinic level. It seems then that the reluctance to make these changes is linked to the change process and resistance portrayed in the debate which focused on the SANC schedule, which could be presented as a ‘legitimate’ reason for not making organizational changes.

Organisational change is often a complex and difficult process (Boshoff, 2005:151; Higgs & Rowland, 2005:121). A brief discussion of the change process and elements of organisational change follows.

The process of change is ongoing in today’s organisations due to the continual changes in the organisation’s environment. This is particularly true for the health care environment

in which primary health care services are provided. The development of the district health system and decentralization of primary health care has an effect on all staff working at primary health care level. These changes cannot be separated from the changes in political, economical and social environment of the present day South African society.

Lewin (1946) cited by Boshoff (2005:150) described the process of change which includes the phases of unfreezing (identifying the problem); moving (implementation of new strategies); and refreezing, which is the end result of the process of change, and results in stability. The unfreezing phase is often a difficult process because it involves moving away from the old comfortable way of doing things to a new, unfamiliar way. Lewine's theory is seen by a number of authors as not intricate enough to deal with all the complexities of planned change (McKenna, 1997:180), but is a useful foundation for more comprehensive theories of change.

The foundation for change is an internal personal process of change; this personal development involves the acquisition and internalisation of knowledge and information (Boshoff, 2005:151), referred to as cognitive redefinition by McKenna (1997:180). The process of change in organizations therefore needs to include as a foundation the process of personal change, which is achieved by means of educational opportunities for individuals in order to acquire and internalise information. McKenna (1997:180) further states that health care settings are particularly resistant to change, and, where change is initiated, it is often short lived. It is also noted that nurses appear to be resistant to change. Lindsay cited in McKenna (1997:181), states that nursing is still deeply traditional and suspicious of innovations.

Change is a problem-solving process (Boshoff, 2005:150) with the following steps identified: the identification of the problem; a clear investigation of the problem; the generation of possible strategies to solve the problem; the selection of a particular strategy; the implementation of the strategy; the evaluation of the effectiveness of the adopted strategy; and corrective action, if required. McKenna (1997:179) refers to this as

developmental change and it takes the form of sequential orderly phases which is mostly predictable and controllable.

Elements of change can be consolidated into categories related to the organisation, its management and its personnel. Each of these is discussed in more detail here. Boshoff (2005:150) describes the organisational factors that impact on change as the role of management; an external focus that includes the evaluation and scanning of the environment; a well-understood mission and goals; strategic planning and responsiveness to customers' requirements, and the fostering of relationships with suppliers. Further organizational elements are the desired level of service quality and the resources available. In addition to organisational factors, management and leaders play a critical role in facilitating organizational change. Bair and Gray (cited in Boshoff, 2005:150) state that part of a manager's job is to act as a problem solver and change agent. A change agent may be defined as a person or group that takes responsibility for changing an existing pattern of behaviour. The author emphasizes the need for managers to be open to new ideas, to be able to identify situations that require change, and to support the implementation of new ideas. Personnel is the third aspect that requires consideration in regard to change management. Boshoff (2005:150) refers to a number of studies which provide evidence of the essential component of active involvement of all members in order for change to be successful and lasting. People tend to support what they have helped to create.

It follows logically then that a change program needs to be implemented within the context of each organisation's management, organisational and personnel elements that impact on the process of change. In order to address these elements related to personnel involved in the change process, the principles of adult learning must also be considered because they form an essential part of the basis for change.

The participants in this study was exposed to a different approach in antenatal care which was in opposition with what was known and prescribed by the regulatory body of the profession. When presented with evidence on the quality of antenatal care during the

training program, the participants was open to listen to new evidence on how to improve care, and this phase could be linked to the ‘unfreezing’ phase as described by Lewine. Participants were exploring the information related to the new concept and new evidence in antenatal care, discussing and thinking (reflecting) about the implications of such a change. The difficulty verbalized in the ‘change of the SANC rule’ could be seen as a way of expressing involvement in a change process.

In the sub theme that follows the different levels of need and interest in training is discussed.

5.2.2.2. Sub Theme 2.2. Staff verbalised differing levels of need and interest in the training and implementation

The different levels of need and interest in training or learning related to the implementation of the BANC package is discussed in this sub theme with particular reference to adult learning as part of the change process (Boshoff, 2005:52).

Mezirow’s theory of transformational learning focuses specifically on learning in adulthood. Gravett (2001:23) refers to this theory when discussing transformative learning as a process that occurs when a person is faced with a dilemma, which leads to the modification of old views and the development of new ones. Boshoff (2005:151) refers to Mezirow’s theory when defining transformative learning as a critical reflection on current beliefs, norms and views that lead to reinterpretation of current and past behaviour into a new perspective. Gravett (2001:35) further emphasizes the significance of opportunities to articulate and engage in dialogue regarding current practices. Dialogue refers to a respectful relationship, with participants thinking and reasoning together. The reasons why adults participate in educational activities are complex (Gravett, 2001:9). It is often argued that adult learners seek education out of a sense of need. However in some work related programmes, for example, where training and staff development form part of conditions of employment, participants might have little or no sense of need.

Participants who trained at clinic level experienced a different level of interest in learning and implementation. Learning at clinic level took place at a different pace for different learners.

“Although they were negative in the beginning, saying that, they cannot work with these things, saying that you always come with new things and new changes...”

“At first you could see that some of them were negative, but we had to be very persuasive you know and stand round them... ”

“I cannot say because the one is quick to understand that the other one will also be quick to understand”

Learning about the BANC package and the quality of antenatal care is not necessarily identified as a need by the primary health care professional nurses. They often do not consciously make the connection between the maternal and perinatal deaths occurring in hospitals and the quality of care they provide at clinic level. In considering learning transfer and what may influence it Tasse & Hrimech (Undated:3) described successful and unsuccessful transfer situations. Learning transfer can be influenced by many factors that can either facilitate or hinder it. Tasse & Hrimech (Undated:5) discussed successful and unsuccessful learning transfer situations summarized below:

Successful learning transfer situations:

- Follow-up: In the form of coaching or other forms of follow-up. Follow-up could be in the form of coaching sessions or informal sessions through a monthly discussion of a particular topic. Follow-up would remind trainees of the topic and its application, decreasing the probability that it would be forgotten and its application delayed. The master trainer continued to meet with the trainers on alternative weeks to complete the protocols. Two meetings were arranged with a

consultant at the referral hospital for discussion of the protocols and to clarify any uncertainties in the management regime.

- Motivation: Trainees who immediately see the advantage of the new knowledge and how it can be applied was more motivated to learn. No update in antenatal care had been provided for a number of years; the training was welcomed by the group of trainers as they could experience the benefit of updating their own knowledge and skills.
- Cascade effect: A senior team member attended training and later taught the same training to other team members. This had the benefit that the junior trainees knowing the seniors had the same training were motivated to learn and the supervisors would realize the complexity of the content and will be in a better position to empathize, transmit and coach skills and knowledge.

Unsuccessful learning transfer situations

- Link between training and work reality: Either the course content was not tied in to their reality or there were no job application possibilities for what was learned. No formal recognition in the form of an educational certificate was given for participants who completed the training.
- Non adherence: The direct supervisor was not involved, the course was therefore not promoted, nor efforts encouraged. Trainees felt this lack of support and in turn they did not adhere to the entire process. Although managers were informed before the training and implementation of the BANC package was started, the support expected was not provided to the participants.

The importance of preparing the trainers for their role will now be discussed.

5.2.2.3. Sub Theme 2.3. Trainers did not receive adequate support at clinic level to implement training of their colleagues

Implementation of the BANC quality improvement package is based on the trainers of trainees approach to facilitate the training and implementation. Although the package

reflects basic antenatal care, the implementation process has aspects of complexity like principles of training and adult learning, and change management. Participants recognised that in combination with a normal day's work this is quite a daunting task as reflected below:

“Where I am, it’s very demanding, because you have to run the whole clinic and again then come and train...”

Throughout the training and implementation process of BANC the participants was expected to complete training at clinic level in addition to their normal workload. The pressure was most likely aggravated by the fact that the participants’ own training was held on a weekly basis, leaving them with the remainder of the week to complete the training at clinic level. Time had to be set aside during the week for training at clinic level, in addition to attending training on a Friday. In providing the training to professional nurses at clinic level it was expected that an arrangement would be made for a specific time during which the trainer and the clinic staff would sit together and go through specific aspects of the BANC package. Each of the five training sessions took the researcher about three hours to train the trainers, therefore it was expected that a session should last at least two hours at clinic level. Specific information had to be reviewed during each session with time available for discussions. No arrangements were made to relieve trainers of some of their normal duties. Due to time and other pressures the training sessions seems not to have happened as expected at the clinic level. The following quote explains:

“I didn’t have any formal training sessions as such; I basically had two or three sessions with members of the staff where I explained the whole concept to them and tried to sell the idea to them.”

“...working alongside each other and working together and teaching people alongside each other in formal training sessions.”

The trainer of trainers approach used in the implementation of the BANC package is based on principles of adult learning. Participants are encouraged to plan the training and set aside time at clinic level for training sessions. Training should then result in changes in the way antenatal care is provided at clinic level. Maintaining the momentum of training regularly and effecting the organizational changes at the same time was perceived as challenging.

In discussing limitations to effect change through training Bradley, Lynam, Dwyer & Wambwa (1998:1-5) present the following:

- **Training systems are divorced from supervisory systems**

Supervisors have little role to play in identifying training needs, planning for training, selecting staff to be trained, or conducting follow up. This increases the isolation of training systems and decreases the likelihood that training will fit local needs and help solve problems.

The responsibility for training and implementation of the BANC package rested with the trainers. The need for the training and quality improvement in antenatal care was identified by the researcher rather than the supervisors of the clinics. The audit of antenatal cards assisted to present the problem of poor antenatal care to those who took part in the audit. Managers were consulted when the trainers and research assistant were identified, but no support was provided to allow trainers additional time for training. Although feed back was given to supervisors the implementation was seen as a research project and managers distanced themselves from the implementation and support for trainers.

- **Follow up is lacking**

Trainers and master trainers working in centralised systems lack the resources to stay in contact with widespread, scattered trainees; thus it is hard for institutions to know if trainees are correctly and effectively using the knowledge and skills they have acquired. Qualified supervisors could do the training follow up, but trainers and supervisors are rarely linked. The trainer is not part of the site team and therefore is not helping to build capacity and solve problems locally; likewise, the supervisor is not part of the training team and therefore is not helping to identify and respond to local needs (Bradley, Lynam, Dwyer & Wambwa,1998:2).

The BANC trainers were closely linked to the clinics either as first level supervisor or working at the clinic. Both these situations presented challenges. The supervisor was not relieved of any of her normal duties and was challenged to complete the training at clinic level. The professional nurse at clinic level had a normal working day with no relief from seeing clients visiting the clinic.

- **Knowledge and skills acquired during training are not applied to the trainee's work**

The application of newly acquired knowledge and skills to the workplace is perhaps the most important aspect of training, and yet is often the most neglected. Training does not always lead to a change in performance at the service delivery site because it addresses acquisition of knowledge and skills but not the individual's role at the site. Studies in the United States have found that only 40% of skills learned are applied immediately, after six months only 25% of skills remain, and after a year only 15% remain (Bradley,et al. 1998:4).

In one clinic the trainer was moved to another section before she could complete the training and implementation of the BANC package. She returned to the antenatal clinic a

few months later, therefore she could not apply newly acquired knowledge and skills, immediately.

- **Training focuses too much on individuals and not enough on the systems in which they work. Capacity building at local sites is limited.**

Most training takes place away from the service delivery site. Colleagues and support staff who do not participate are neither oriented to the training content nor involved in decisions about how to support the trainee in improving job performance. Individual trainees may be better equipped to do the job, but unable to function in an unsupportive work environment. They sometimes face hostility aimed at them personally and at their newly acquired skills. Colleagues may be jealous. Sometimes taking trainees away from their workplace to a centralised training location can have the effect of mystifying the course and the skills gained. Some trainees may thus feel that they are keepers of the new information and disinclined to share it. Often there is nobody on site to make sure that the skills learned are used (sometimes staff may even be put into positions where they cannot use the skills) or to promote learning among staff. Thus the site has no reservoir of skills when trained staff leaves the facility (Bradley, et al.1998:3).

The BANC package is structured in a way that the trainer is away from the service delivery site or clinic for only a short period of time, and this time can be arranged at the convenience of the clinic personnel. The training material was found useful as discussed in sub theme 1.1.

- **Trainees are selected inappropriately**

Often in centralised training inappropriate trainees are selected because those making the choices do not fully understand the purpose of the training, because the trip away from the site is used as a reward for staff, or because it is someone's turn rather than in response to site needs (Bradley, et al.1998:3).

Selection of the trainers was discussed with the relevant managers and every effort made to select the appropriate trainer for each clinic. There was no or very little reward for the trainers except an improvement in their own knowledge and skills and a commitment to undertake the training at clinic level over and above their normal duties. Despite this effort one trainer was rotated out of antenatal care and another retired a few months after the completion of training.

- **The content and timing of training are inappropriate and do not reflect the realities of the service**

Instead of participating in training that addresses the specific needs of their service sites, trainees often have to accept what is offered (“just in case” it is needed), and real site needs may never be met. Trainees may be trained in an environment that is unlike their own work environment, and thus feel that they are unable to apply newly learned knowledge and skills. Sometimes staff has no immediate opportunity to apply what they have learned; training is conducted too early or too late. Finally training may not be the appropriate solution to the problem at the site (Bradley, et al.1998:4).

The BANC package was designed with current evidence of poor quality of antenatal care reflected in the mortality rates recorded for South Africa. The training material was appropriate for the primary health care professional nurses as discussed in main theme one.

- **Off-site centralised training is unable to meet expanded needs for training**

As demand for services grows and as the types of training needed to expand in scope, the need for staff training increases. Yet, because formal centralized training is expensive, trainee places are limited and training demand may not be met (Bradley, et al.1998:2).

This is not applicable to the BANC training package.

- **Services are disrupted**

When staff members are away attending training courses, services at the home site are interrupted. This is particularly true for small clinics that rely on one or two staff members to deliver services (Bradley, et al. 1998:3).

The trainers of trainees approach limit the disruption to service delivery in that the trainer is part of the clinic staff. However this could have contributed to training not taking place as it would be difficult for staff to disrupt services and leave patients waiting while they continue with training. This is illustrated with the quote below:

“I had to leave my colleagues during the day...to do this training”

The last sub theme under the main theme of acting as a trainer is difficult will now be discussed.

5.2.2.4. Sub Theme 2.4. Staff need supervision for effective implementation in practice

The World Health Report 2006: Making the most of health workers (WHO, 2006a: 75) dedicated a chapter to helping the existing workforce to perform better. In describing a well-performing workforce the report states: *“Health worker performance is critical because it has an immediate impact on health service delivery and ultimately on the population’s health. A well performing workforce is one that works in ways that are responsive, fair and efficient to achieve the best health outcomes possible, given available resources and circumstances.”*

In this study the objective was to assess the implementation of a quality improvement package for antenatal care. The successful implementation relies on the availability and effective functioning (performance) of the professional nurses at primary health care level (managers, trainers, clinic staff), which in turn may be influenced by effective

supervision. In order to perform effective supervision supervisors require skills. A participant, who is also a supervisor of a clinic, expressed it as:

“If you are supervising in those clinics (where BANC is implemented) you yourself should be well skilled”

Too often supervisors lack skills, useful tools and are burdened with administrative duties (Rowe, de Savigny, Lanata & Victora, 2005:1030). The authors suggest that performance problems cannot be solved by training alone, but multifaceted interventions for example training plus supervision, might be more likely to improve performance than single interventions. In the implementation of the BANC package the objective is the improvement of the quality of antenatal care within the “...given available resources and circumstances.” (WHO, 2006a:75). The performance of the professional nurses providing this service and their supervisors will impact on the way the BANC package is implemented and the outcome of the quality of antenatal care provided.

Supervision, especially coupled with audit and feedback to staff, has been consistently found to improve the performance of health workers, from providers to managers (Rowe, et al, 2005:1026). While the intent to supervise is almost universal, it often proves difficult to put into practice and becomes the first casualty in the list of priorities for busy and resource constrained managers (WHO, 2006a:75). Supervision often becomes more difficult but even more important in health systems that are decentralising (WHO, 2006:75). Determinants of supervisors’ performance should be understood and strategies implemented to support supervisors and improve their performance (Rowe et al., 2005:1030). The author also states the importance of supervision as an ongoing process over a longer time span, if it is to be effective. Rowe et.al. (2005:1029) writes that supervision can improve performance, at least in the short term. If correctly done supervision could be a mechanism for providing professional development, improving health workers’ job satisfaction, and increasing motivation. Although often dysfunctional, supervision systems are present and with decentralization of health care, supervisors are increasingly the only human contact between health workers in remote villages and the

rest of the formal health system. Lastly, most managers already think that supportive supervision is valuable.

The Eastern Cape Department of Health developed a policy on clinic supervision to guide supervision for the ±700 clinics serving 6 million people (Eastern Cape Department of Health, 2001:1-3). The diversity of these clinics related to staff, size, complexity, staffing, patient load and range of activities complicated by the numerous authorities overseeing the work of these clinics, necessitated the development of such a policy. The main objectives of the policy are to:

- Ensure that resources are in place for technically correct care
- Ensure quality of services from the client perspectives

The Eastern Cape Department of Health policy included specific tools to direct the process of clinic supervision. These tools are in the format of a supervisory checklist for each primary health care programme. Such a checklist would assist the supervisor to review the quality of certain aspects of a programme and would assist the professional nurses to self-correct deficiencies. The checklist provides a written report of the visits and assists the supervisor and clinic staff to plan together to address deficiencies identified. The checklist also indicates which aspects of the programme is functioning well and supports continuation of that. In line with this process an evaluation tool was developed for the supervision of the implementation of the BANC package.

Acting as a trainer and change agent is not an easy task and needed support from managers at all levels to ensure effective training and implementation of the BANC package at primary health care clinic level. Participants indicated that the new approach holds benefits and challenges for service provision. This main theme will now be discussed.

5.2.3. Main Theme 3. The new approach holds benefits and challenges for service provision

The interviews indicated that the participants experienced benefits but also challenges in the implementation of the BANC package. The benefits and challenges are discussed under the following sub themes:

- Primary health care professional nurses were not able to focus exclusively on antenatal care
- Implementing the training in the clinics was described as problematic.
- A procedure of staff rotation is applied to address issues of staff shortages
- Managers can describe the purpose and process of BANC principles but are vague on utilization in practice
- Managers have insufficient knowledge to effectively monitor implementation
- The BANC tools assisted the primary health care professional nurses to provide better quality of care.
- Staff have more time for other tasks

These will now be discussed.

5.2.3.1. Sub Theme 3.1. Primary health care professional nurses were not able to focus exclusively on antenatal care

Challenges reported in the interviews referred to the way clinics function and the availability of personnel. In the larger clinics a professional nurse was allocated to provide only antenatal care services (vertical programme), whilst in the smaller clinics the professional nurse providing antenatal care services was usually expected to provide other services as well (horizontal services) such as child health care, HIV/AIDS, tuberculosis and treatment of minor ailments. The advantage of the vertical system was that the person becomes practiced in one focussed service area with in-depth knowledge and expertise. Patients will come to know the primary health care professional nurse and most likely be more motivated to return for follow up visits. The drawback is that when

this person is not available other professional nurses working in the same clinic do not feel competent and comfortable to take her place. In smaller clinics the professional nurses provided a more comprehensive service where antenatal care was only one of the services provided throughout the day.

“In our clinic the sister doing antenatal is also doing the other sessions in the clinic, so they cannot exclusively focus on antenatal”

In these clinics there was a real challenge for the professional nurse to remain up to date with new evidence and procedures related to all the primary health care programmes. In these clinics there was an even greater opportunity for the implementation of the BANC tools namely the integrated flowcharts and clinic specific protocols to support the improvement of the quality of antenatal care provided. This was particularly valuable for the first visit at pregnancy confirmation where the checklist ensured that all aspects of care had been covered.

The next sub theme relates to further training needs that were identified and is now discussed.

5.2.3.2. Sub Theme 3.2. Implementing the training in the clinics was described as problematic.

The implementation of the BANC package created an awareness that the quality of service provided to pregnant women needed to improve. Processes of change, training and learning, improved the self-esteem and confidence in participants. The training materials were useful for training but it was also identified that the role of the trainer is a difficult one. Resulting from all the above processes many participants expressed a need for further training.

“I think more training for the staff that has to implement it...”

“I personally... need more knowledge on IUGR (intra uterine growth retardation)...”

“The practical part... we don’t get the same measurement with symphysis fundal height...”

“ we have a bit of a problem ...getting those dates lined up...”

Participants expressed a need for further training particularly referring to the practical aspects of training. A training compact disc is included as part of the BANC package and contains all the essential procedures required to perform an antenatal assessment. However the primary health care clinics did not have computers available at facility level and could not view the training compact disc. The compact disc was therefore useful in training the trainers, but not accessible to train at clinic level. The skills demonstrated on the compact disc are:

- Pregnancy test
- Urine testing
- Haemoglobin measurement
- Rapid Rh and HIV test
- Blood pressure measurement
- Abdominal examination
- Vertex delivery
- Breech delivery
- Examination of the placenta
- Speculum examination
- Ferning test
- Amnioinfusion
- Tap test (Makin & Treadwell, undated: Compact disc)

Only skills related to antenatal care was demonstrated or viewed by the trainers. For example the HIV rapid test was a practical demonstration, but vertex and breech delivery were not viewed. Participants identified the need for further practical training. For example the abdominal palpation of a pregnant woman with the correct assessment of

fetal growth was mentioned in the quote above. These skills need to be practiced until competence is achieved. The trainer at clinic level needs to oversee this practice or establish a support network at clinic level to support the development of practical competence. This is an area where an advanced midwife or experienced midwife could play a supporting role. The in-service training programmes at clinic level could be used for ongoing training, supported by the staff from the Community Health Centre and/or District Hospital to which the clinic refers clients.

The World Health Report 2006 (WHO, 2006a:67) writes that Governments have an obligation to society to ensure that limited human and financial resources are used as fairly and as efficiently as possible. In many instances an action to improve staff performance is training. Improving skills and knowledge is a strategy employed to improve worker performance. The numerous projects and programmes created in response to the millennium development goals are replete with budget lines to train staff, but lack comprehensive workforce strategies. As a result a great deal of effort is directed towards running short training courses. The aim of most of these courses is to equip health workers or trainers of health workers with the skills to deliver specific interventions. Staff is rarely replaced when they travel or leave their service point for training.

Health workers need up-to-date knowledge to perform well. Rapid increases in knowledge and changing health systems make this need even more essential today (WHO, 2006a:82). In-service training is most likely to change worker behaviour when it is interactive, based on real-life problems and coupled with continuing intermittent support. The role of the manager to facilitate this process is crucial for the effective implementation of the BANC package and for quality improvement in general. Rowe, et al. (2005:1030) described the effect of supervision, especially coupled with audit and feedback to staff, to improve the performance of health workers. A component of supervision should be to assess and address training needs.

The sub theme discussed below focus on the rotation of staff and issues of staff shortage.

5.2.3.3. Sub Theme 3.3. A procedure of staff rotation was applied to address issues of staff shortages

Rotation of staff as a sub-theme emanated from a number of participants across the spectrum of trainers, managers and clinic staff. Staff rotation is generally practiced and seems to be linked to and used to address the issue of staff shortages. The understanding of rotation is that a professional nurse is allocated to work in a certain section of the clinic providing the services to patients for a specific primary health care programme for a limited period of time for example for three months. The professional nurse working in antenatal care after three months will only just have adjusted to the BANC programme, getting to know all the aspects for antenatal care and developed a relationship with her clients. After three months she is replaced with a professional nurse who must again go through a learning and adjustment phase. This prevents the development of expertise. Further to this, no ownership can be cultivated for the unit and prevents any effective long-term planning. Staff rotation was expressed in the following quotes:

“Unfortunately for us as a unit we have this rotation policy, that after a certain number of months a person must go to another department, and so the sister trained in BANC had to move to trauma...”

“Always it is this issue of shortage of staff...it makes it impossible to keep a person (profession nurse) in one place...if I had enough staff I could afford to keep the person there for the year...”

“we will not be able to render a quality service because for quality service we need staff...”

Rotation creates problems with staff performance and commitment. Some quotes explain:

“Like now we have this problem of shifting staff...it means you can't get commitment... a person knows that after three months they're going to move.”

“Now the new person who started there must still grapple with everything...if it was the same person who continued, it would be much easier to accomplish our objectives”

“There is such a shortage of staff...”

The rotation practiced at clinic level has implications not only for antenatal care but for all programmes as well as training programmes to improve quality of care. Of the five trainers trained, one was rotated out to another area and one was sent for a different training course. What is not understood is why rotation is seen as a measure to address the issue of staff shortages. In this study the BANC package was implemented within the available resources and constraints of primary health care. A strategy to address staff shortages is a huge undertaking and will not be discussed here. The World Health Report 2006 (WHO, 2006:67-89) discussed the issues of how to make better use of existing health workers focusing on health worker performance rather than increasing the number of health workers.

The objective of the BANC package aligns with strategies to improve the quality of care for pregnant women by optimizing the performance of current health care workers specifically the professional nurses at primary health care level. A discussion will now focus on how performance can be improved within the current context of primary health care.

According to the World Health Report strategies to boost worker performance are crucial for four reasons (WHO, 2006a:67):

- They will be likely to show results sooner than strategies to increase numbers
- The possibilities of increasing the supply of health workers will always be limited

- A motivated and productive workforce will encourage recruitment
- Government have an obligation to society to ensure that limited human and financial resources are used as fairly and as efficiently as possible

Health worker performance is therefore very important as it will have an immediate effect on services provided. For many years it was assumed that poor health worker performance was primarily caused by a lack of knowledge and skills. In recent years this perception has changed, and three broad groups of factors affecting health worker performance are now recognized and described in the World Health Report (WHO, 2006a:70-71). These are:

- Characteristics of the population served: It is easier to increase immunization coverage or adherence to treatment of tuberculosis or HIV infection where the population understands the benefits and has the motivation and resources to seek services
- Characteristics of health workers themselves, including their own sociocultural background, knowledge, experience and motivation
- Characteristics of the health system, and the wider environment, that determines the conditions under which health workers work. These include the inputs available to them to do their jobs, how the health system is organized, how the workers are paid, supervised and managed, and factors such as their personal safety (WHO, 2006a:68).

These factors are interconnected. For example, the motivation (the level of effort and desire to perform well) is considered by many to be crucial to performance. Motivation is determined both by factors internal to health workers and by factors in their work and social environment. Leverage can be applied to stimulate better performance from both individuals and the health workforce as a whole. The main levers available to support performance include a group that is job related; those that relate to the support systems that all workers need to do their jobs; and levers that shape and create an enabling work environment. It is rare to find a direct relationship between one specific lever and a desired change. The strategy of particular importance to the implementation of the BANC package is supportive supervision.

The following sub theme focus on the role of the manager.

5.2.3.4. Sub Theme 3.4. Managers could describe the purpose and process of the BANC principles but were vague on utilization in practice

Managers and leaders play a critical role in facilitating organisational change (Boshoff, 2005:150). Part of the manager's job is to act as a problem solver and a change agent. Although managers were not trained on the implementation of the BANC package, a number of sessions were held beforehand to introduce them to the concept and the implication for practice, gaining support for the changes planned. It was explained that managers would be expected to provide the following support to ensure the successful implementation and transition to a new system of antenatal care using the BANC package:

- Managers should assist to identify a suitable professional nurse to train as trainer
- Managers need to allow time for the trainer to be trained
- Managers need to allow time for the trainer to train her colleagues at clinic level
- Managers need to support the trainers and clinic staff to make the necessary organisational changes in the way antenatal care is performed (checklists, initiation of antenatal care at pregnancy confirmation, new WHO schedule of visits)
- Managers need to enforce completion of tasks as set in the task book
- Managers need to accept and use the audit tool for antenatal care

Managers interviewed had a good understanding of the concept of the BANC package. It was possible to give a detailed description as illustrated in the quote below. Yet throughout the interviews no comments were made related to support or time allocated for training in order to assist the trainer at clinic level.

“My understanding of BANC ... it was an alternative to improve our antenatal care services... to update some of our antenatal care sisters ...and to decrease mortality by detecting problems early in pregnancy...”

“It (BANC) guides one on how to see the patient or how to monitor and what signs to look for and when to refer a patient ... nothing will be missed because you have all the information on the card”

During orientation sessions the expected role of the manager related to the implementation of the BANC package was communicated to all levels of management. Managers are responsible for the performance of health workers and the quality of services provided. Managers also expressed their need for more knowledge to effectively monitor the BANC package implementation. This is discussed in the following sub theme.

5.2.3.5. Sub Theme 3.5. Managers had insufficient knowledge to effectively monitor implementation

Although functioning in a managerial position it became clear that knowledge and expertise in antenatal care was lacking amongst managers. Some managers have not worked with pregnant women for some time and were not exposed to the latest developments. One participant expressed it as:

“I personally, it is long time that I was out of midwifery...I need some more knowledge, especially with BANC.”

Managers need to monitor effective program implementation, identify and solve problems related to systems and resources, and address these. In Sub Theme 2.4 the need for supervision was discussed. It was also stated that according to Rowe et.al. (2005:1030) too often supervisors lack skills, useful tools and are burdened with administrative duties. The authors further state that supervision, coupled with audit and feedback, had been consistently found to improve the performance of health workers. In this discussion reference was made to the Eastern Cape Department of Health supervisory policy placing the supervisor in a position where she functions as a link between the clinic staff and the general manager of primary health care services. Based on the

principles of this policy a BANC supervisory tool (Annexure E.5.) was developed to assist supervisors in their support of the training and implementation of the BANC package. The tool structures the supervisory visit listing specific areas to be discussed and checked. It also makes provision for the audit of a few antenatal cards which the supervisor and professional nurse will do together. On completion of the visit a summary of findings must be discussed and recorded on the tool. Together the supervisor and professional nurse will then identify activities which need to be addressed within a specified time. A copy of the completed tool is left at clinic level and would serve as baseline for the follow-up visit. The researcher visited the intervention clinics to get some feedback on the use of the tool, however further evaluation will be required to ascertain its usefulness to ensure effective supervision for the implementation of the BANC package.

The World Health Report (WHO, 2006a:75) states that supervision makes a big difference. Supportive yet firm – and fair – supervision is one of the most effective instruments available to improve the competence of individual health workers, especially when coupled with clear job descriptions and feedback on performance. Moreover, supervision can build a practical integration of new skills acquired through on-the-job training. In this process the manager, supervisor and professional nurses at clinic level would be able to share knowledge and skills to enhance performance.

The BANC tools assisted primary health care professional nurses in the management of the pregnant woman. This is discussed in the following sub theme.

5.2.3.6. Sub Theme 3.6. The BANC tools assisted primary health care professional nurses to provide better quality of care.

The use of the BANC integrated flow charts assisted the identification of risk factors and the steps to follow in the management of the pregnant woman. The referral protocols assisted to clarify where the patient should be referred to and the patient was informed of what is happening to her. Using the checklist and flowcharts a decision could more easily

be made as to what would be the appropriate management and when a referral was needed. The effect on the quality of client management is expressed in the quotes below.

“The checklist focuses your attention on certain points, so you cannot go wrong...you have something to check against.”

“The guidelines have a very clear differentiation between what is normal and what is abnormal...”

“At a glance ... (checking the antenatal records)... you can see what is wrong”

“At times we didn’t know where to refer our patient but now even our patient knows what is taking place with them...and if there is a complication they know where to go.”

The client could be better assessed for referral in that risk factors and complications were recognised early and managed with confidence as illustrated with the following quote:

“If there are complications we know how to refer and what to do...”

At one clinic the professional nurse interviewed took out the file where the checklists were filed and indicated on the checklist when she made the following comment:

“The checklist, this one, what you do with mothers when they come, check there urine, check there... (pointing to card) check everything of the pregnancy...if it is their first pregnancy there is so much that we check then”

At another clinic the professional nurse gave a full description of BANC with reference to the package and all the forms and tools she was using. She stated:

“I’m very happy because I’ve seen that it works...it is so well structured”

“I used the guidelines (integrated flowcharts) ...(to identify) patients that qualify and those that don’t qualify.”

The information reflected in the interviews gives some evidence that the pregnant woman is being screened for problems, that risks are assessed, that women are given information and referrals are being done for risk conditions identified. All of these reflect an improvement in the quality of care provided to pregnant women. This supports the objectives stated in the National Guidelines for Maternity Care in South Africa (Department of Health, 2002:18). It also correlates with the quantitative results indicating an improvement in particularly the ‘interpretation and decision’ section of the quality audit.

Participants at clinic level knew about the BANC package and the tools needed to implement the principles. Considering the dilution effect that may result from cascade training this was an encouraging finding. The challenge to consider is how to maintain and improve this level of awareness and improved quality, considering the practice of rotation of staff.

Another benefit experienced was that staff had more time for other tasks once the new schedule of visits was implemented. This is now discussed.

5.2.3.7. Sub Theme 3.7. Primary health care professional nurses had more time for other tasks related to the care of the pregnant woman

Some resistance was experienced to change the schedule of visits as it represented the organisational changes required for the implementation of the BANC package. The immediate period after the implementation of the BANC package was described as chaotic and disorganised. It took about two months for clinics to make the change from the old schedule of visits to the new schedule using the tools of the BANC package and

the appropriate antenatal records. The concern about something going wrong in the pregnancy with a reduced number of visits was quickly replaced by an appreciation for the resultant reduction of client load. This allowed the professional nurses more time to inform clients on issues relevant to the pregnancy. The reduction in client numbers on a specific day was seen as a benefit, as it allowed the nurses to spend time on thorough assessment and health education. The reduced number of visits was verbalised by participants reflected in the quotes below:

“We feel very enthusiastic about it, we can see the benefit we can see that there has been no disasters; we feel that when there is something wrong (with the patient) we have time to educate the patient”

“she (PHC nurse) now has more time, you know it definitely has given us more time for other things as well.”

“I have time with the antenatal, especially the HIV positive ones because there is a lot of young ones that comes to my clinic.”

“(With) seeing the patient less often the clinic is less busy and the staff is less harassed”

“If it wasn’t for the six week intervals the clinic would now be full...”

An anecdote from one clinic tells of a pregnant woman not feeling well and complaining of headache. Although she was scheduled for visits six weeks apart she decided to report to the clinic early as she was aware of the danger signs. She did have a raised blood pressure and was managed accordingly. At one experimental clinic an increase in the number of clients counselled for HIV was reported. The approach with BANC is to give information on all the tests and investigations needed for the pregnant woman, and not to single out the HIV test. This most likely led to more women accepting the test. It was

possible with the reduced number of visits to spend more time on providing appropriate information to pregnant women, especially during the first visit.

5.3. Conclusion

Staff experienced the training as positive. The training material was found to be useful for training and implementation at service delivery level. At the onset the trainers had different levels of experience related to antenatal care and held different positions in the workplace. The training contributed to improved self-esteem and confidence in the trainers and the master trainer seems to have succeeded to create a climate in which adult learning could take place. The impact of the context, and perhaps lack of support from managers, made it difficult for the trainers to replicate the same training at service provision level, resulting in dilution of information to the lower levels. The role of the trainers is perceived as difficult. Rotation of staff creates numerous problems and challenges to any type of training. The BANC package was seen as a challenge but the positive effects were also visible. The challenge will be to limit the dilution effect and to ensure supportive supervision for sustainability. In conclusion the final quotes:

“The benefits out weight the negatives with everything, the protocols, the guidelines, the check list, everything in it, you know when in doubt you know, not like before, you were just fumbling about”.

“It was a challenge, but it was also fun ...”

6.1. Introduction

The World Health Report 2005 (WHO, 2005b:42) states that while antenatal care coverage has improved significantly in recent years, it is generally recognised that the antenatal services currently provided in many parts of the world fail to meet recommended standards. This study was developed to determine the effectiveness of the BANC package to improve the quality of antenatal care at primary health care clinics measured by auditing antenatal cards. A small but significant increase in the scores of both the experimental and the control group motivated the researcher to investigate further and to determine the experiences of individuals involved in the implementation of the BANC package. In Chapter Four and Five the results and findings were reported for the quantitative and qualitative sections respectively. In this chapter the conclusions and recommendations are provided. Guidelines are described for training and implementation of the BANC package. Finally the study limitations are listed.

The aim of this study was to evaluate the effectiveness of the BANC package to improve the quality of antenatal care at primary health care clinics. The research process was completed according to phase one and the steps summarised in Chapter One Table 1.1.

The objectives of the study were:

- To assess the quality of antenatal care delivered by primary health care professional nurses in primary health care clinics
- To facilitate the implementation of the Basic Antenatal Care package in five selected experimental clinics
- To evaluate the effectiveness of the Basic Antenatal Care package by determining the quality of antenatal care by an audit of antenatal records

- To determine experiences of individuals of the training and implementation of the Basic Antenatal Care package
- To make recommendations and develop guidelines for further training and implementation of the BANC package

Phase One of the study namely to determine the effectiveness of the BANC package to improve the quality of antenatal care in primary health care clinics, was achieved by completing the steps listed below. These steps were completed to achieve the following research objectives.

The objective ‘to assess the quality of antenatal care delivered by primary health care professional nurses in primary health care clinics’, were achieved by completing Steps One, Two, Three and Four.

- Step One: A literature review was done to obtain a general overview of the research problem.
- Step Two: The pre-designed data gathering instrument, called the audit tool, was refined.
- Step Three: A pilot study was conducted to test the validity and reliability of the audit tool by test-retest correlation and interrater reliability.
- Step Four: A baseline of the quality of antenatal care in primary health care clinics was determined in the experimental and the control group of clinics by auditing antenatal cards of pregnant women.

The objective ‘to facilitate the implementation of the BANC package in five selected clinics’ was achieved by completing Step Five.

- Step Five: The BANC package was implemented using the trainers of trainees approach to train field assistants from the five experimental clinics. The trainers were then tasked to train professional nurses at primary health care clinics in the experimental group, and to implement the BANC package in these clinics.

The objective ‘To evaluate the effectiveness of the Basic Antenatal Care package by determining the quality of antenatal care by an audit of antenatal records’ was achieved by completing Step Six and Step Eight.

- Step Six: Three months after the implementation of the BANC package the quality of antenatal care was assessed in the experimental and the control group of clinics. Following the initial data analysis a small improvement of the quality of care was measured in the experimental group and also in the control group.

The objective ‘To determine experiences of individuals of the training and implementation of the Basic Antenatal Care package’ was achieved by completing Step Seven.

- Step Seven: This finding prompted the researcher to determine experiences of individuals involved in the training and implementation of the BANC package.
 - * To reach this objective a focus group interview was done for the trainers asking the following questions:
 - *How did you experience your own training in the BANC package?*
 - *How did you experience training other people in the BANC package?*
 - * Individual interviews were done with managers and professional nurses involved with the experimental clinics asking the following question:
 - *How did you experience the training and implementation of the BANC package in your clinic?*
- Step Eight: Six months after the implementation of the BANC package the quality of antenatal care was assessed in the experimental and the control group of clinics

Phase Two of the Study namely to develop guidelines for training and implementation of the BANC package is completed and described in this chapter. The final objective ‘to make recommendations and develop guidelines for further training and implementation of the BANC package’ was achieved and described in this chapter. Guidelines will not be refined or tested by asking professionals not involved in the guideline development to review it for clarity, internal consistency, and acceptability (Thomas, 1999:38).

In the following section the findings are summarised.

6.2. Summary of findings

The steps completed during the research process enabled the researcher to reach the research objectives. The effectiveness of the BANC package to improve quality of antenatal care to pregnant women was determined. Knowledge of experiences of individuals involved in the training and implementation of the BANC package contributed to identify issues related to the training and implementation at primary health care clinics. Knowledge generated was used to complete Phase two of the study namely the recommendations and the development of guidelines for training and implementation of the BANC package at primary health care clinics.

Findings from Chapter Four and Chapter Five are summarised below:

The results reported in Chapter Four and Chapter Five led to the following conclusions:

- The implementation of the BANC package requires organisational change at clinic level related to antenatal care service provision. These changes need to be in place before quality of antenatal care measured by an audit tool is expected to improve. The BANC package facilitated these changes with tools like the integrated flow charts for client management, management and referral protocols, and the checklist.
- The reduction in gestational age at first visit from 26.9 weeks to 23 weeks indicates that women are seen earlier in pregnancy. Providing women the opportunity of antenatal care services early in pregnancy improves access to the health service and provides an opportunity to screen women for HIV AIDS, nutrition status, tuberculosis and malaria, as well as an opportunity to provide pregnant women information related to the pregnancy and to develop a birth plan. The implementation of the checklist and the integrated flowcharts assisted primary health care professional nurses to provide the first visit at pregnancy confirmation.
- Implementation of the checklist and the standardised Eastern Cape antenatal card provided a standardised patient record system for primary health care clinics. Standardised documentation assists professionals particularly with referral between different levels of care.

- The new WHO schedule of visits implemented resulted in a reduction of client visits allowing the primary health care professional nurses more time for other tasks, for example to provide effective and appropriate health education and information to pregnant women. This also allowed for developing a birth plan, including discussion of future contraception and transport arrangements to a health facility when labour starts or when danger signs are present. In four of the five experimental clinics these organisational changes were implemented, but it took longer than anticipated for these changes to become part of the clinic system. Once the reduction in visits was evidenced in a reduced patient load, professional nurses reported it as a positive outcome as they have more time with patients, know patients better and can spend more time on care and giving health related information.
- Clinic specific protocols were not completed by trainers of trainees for all five clinics during the time allocated for training. It was not clear if this was a result of time pressure alone or if other factors contributed. It was difficult to finalise protocols without regular meetings between the staff from the antenatal clinics and the medical personnel working at the referral hospital. The protocols are critical in the management and referral of patients.
- Defining and reviewing referral routes, based on the integrated flow charts, assisted primary health care professional nurses to clarify ‘when’ and ‘where’ to refer pregnant women. Apart from medical conditions like hypertension in pregnancy, referral on social issues and nutrition were also addressed.
- The improvement of the quality of antenatal care was small as measured in the experimental as well as the control group. Further analysis of the three main categories indicated a significant increase in the ‘interpretation and decision’ section of the experimental group but not in the control group. The significant continuous quality improvement in the experimental group measured in the ‘interpretation and decision’ section of the audit tool is a positive finding as it could impact on the outcome of pregnancy. Improvements gained in the control group diminished over time whereas the improvements in the experimental group

was either maintained or further improved. Audit after a longer period of time may yield a larger score improvement in the experimental group.

- The improvement in the 'History' and 'Examination' sections are contributed to better recording resulting from the audit and feedback process in both the experimental and control groups. The criteria on plotting were more difficult to improve. It involved practical and cognitive skills. This area is of critical importance in identifying intra-uterine growth restriction and post maturity in unborn babies.
- Primary health care professional nurses found the BANC package useful and liked the BANC tools to provide antenatal care at clinic level.
- The training material and the training approach supported learning transfer of new evidence and developments in antenatal care. The dilution effect of cascade training need to be managed and requires the support from supervisors and managers.
- The trainers of trainees experienced their role as difficult to fulfil in the context of current primary health care setting, particularly the implementation of changes which differ from the original training and how to ensure effective learning transfer. They needed specific preparation for the changes which had to be implemented to deal with change management at clinic level. The importance of supportive supervision is documented, but evidence of such support was lacking from the interviews with managers.
- Further training was requested by the trainers of trainees as well as the professional nurses at clinic level, particularly on the practical component. This included for example the procedure on abdominal palpation; the estimation of the expected date of delivery; and the plotting on the graph.
- The schedule of visits according to the SANC rule creates conflict for primary health care professional nurses. It does not correlate with the schedule advocated in the National Maternity Guidelines for South Africa (Department of Health, 2002:26). Evidence from WHO randomised control trial (Villar & Bergsjø, 2002:12) indicated no difference in pregnancy outcomes for women with fewer visits and four visits for a pregnancy are recommended for women qualifying for

the basic component of antenatal care. It was however difficult to convince the midwives to adopt the new schedule of the WHO.

- The support from managers was critical to facilitate and sustain changes implemented with the BANC package. Although addressing the basic component of care for pregnant women, training and implementation of the BANC package is rooted in principles of quality assurance and change management
- Trainers had difficulty training professional nurses in their clinics as they were not relieved from existing duties and no time was made available for the in-service education in the clinics. Their own training sessions with the master trainer needed to be scheduled further apart to allow them time to train at clinic level.
- The effect of the BANC package on the maternal and perinatal mortality and in particular on stillbirth rate, cannot yet be assessed. Before a difference is expected more clinics in the Nelson Mandela Bay Metropole need to be involved over a longer period of time.

From these findings recommendations were developed and are described below.

6.3. Recommendations

With reference to the findings described in previous chapters and conclusions described above, recommendations will be discussed for nursing education, clinical nursing and nursing research.

6.3.1 Nursing Education

Knowledge of the principles of the BANC package needs to be distributed to all institutions involved in the education and training of midwives. Student midwives need to be informed of the new approach in antenatal care to prevent conflicting messages during their training.

Professional nurses currently working in primary health care settings, need to be exposed to the BANC package to ensure uniformity in applying the principles of the BANC package.

The trainer needs the support from her supervisor to assist in either relieving her from some of her normal duties or to provide assistance to enable the trainer to train. The development of a specific training programme will structure the training and will contribute to minimise the dilution effect of cascade training. Once BANC is implemented the programme for in-service training at primary health care clinics should include time scheduled for BANC training. This could be used for training new staff in BANC. Maintaining a training record will assist to track training sessions and ensure all staff receive training in all sessions of the BANC package.

6.3.2. Clinical nursing

The following is recommended for clinical nursing:

- The BANC package should be implemented in all the clinics in the Nelson Mandela Metropole. District hospitals (and the regional referral hospital) receiving referrals from these clinics should also be orientated on the principles of the BANC package.
- Protocol development should be a combined exercise between the clinics and referral hospitals to assure agreement and support.
- The BANC handbook, integrated flowcharts and protocols for referral and treatment should be available at each consulting room where pregnant women receive care.
- Standardised equipment as suggested in the BANC package should be available at all centres where women receive antenatal care.
- A follow-up audit of antenatal cards one year after the implementation of the BANC package would be useful to assess the improvement in quality of care.

- Monitoring of the perinatal mortality over time in the quarterly perinatal audit meetings, based on the perinatal problem identification programme and DHIS to assess changes in mortality rates, is recommended.

6.3.3. Nursing research

The following is recommended for nursing research:

- This study involved only five primary health care clinics in a metropole. A larger study with a bigger sample of clinics, including clinics from a rural setting is recommended.
- The development of a model for antenatal care based on this study is recommended. Chinn & Kramer (1995:76) states that models expressed in language are often called conceptual models and the authors are of the opinion that conceptual and theoretic models can be represented as a part of theory, can coexist with theory or can be constructed to show links between related theories. A conceptual model is a set of highly abstract, related constructs that broadly explains a phenomenon of interest, expresses assumptions, and reflects a philosophical stance (Burns & Grove, 2005:9).
- Based on the findings and conclusion of this study it is recommended that an antenatal care policy should be developed for the Eastern Cape to inform on issues for example the schedule of visits and principles of antenatal care as reflected in the BANC package. The term policy is often used to refer to ministerial statements and speeches, technical guidelines such as those contained in training materials, planning documents, decrees, directives and circulars, that influence public health activities in the health sector, at health facility and community levels. The term may also be used simply to refer to established, prevailing practices in a specific domain (WHO, 2004c:6). The steps for policy development as applied to the development of a national child health policy (WHO, 2004c:6) could be used namely:

Step 1: Situation analysis (based on implementation of the BANC package)

Step 2: Policy document development (Draft)

- Step 3: Verification of the draft policy (Including advocacy and consultation)
- Step 4: Official adoption of the policy document
- Guidelines as set out can be implemented and it's effectiveness determined

The results and evidence obtained by completing phase one of this study were used to develop guidelines for training and implementation of the BANC package. These will be described below.

6.4. Guidelines for the Effective Implementation of the BANC package

The general aims of guidelines is summarized by Rosenbrand (2004:1) as

- * To summarize and synthesise knowledge and innovations in medicine
- * To reduce variation in practice
- * To promote evidence-based clinical practice
- * To improve quality of care
- * To satisfy the need for transparency and accountability

A good guideline according to Rosenbrand (2004:3) is one that leads to improved outcomes for patients and needs to be based on evidence, needs to be used (or implemented) and needs to be assessed. Research indicates that to improve practice in accordance with clinical evidence, change is required by individual clinicians and teams of clinicians as well as at an organizational and policy level (Luxford, Hill & Bell, 2000:1). Clinical practice guidelines are “*systematically developed statements to assist practitioner decisions about appropriate care for specific clinical circumstances*” (Field & Lohr in Thomas, 1999:38). Guideline development has four stages. Firstly, a literature search to base the guideline on the best available research evidence. Next, using the research evidence, guideline construction takes place, then the guideline is tested by asking professionals not involved in the guideline development to review it for clarity, internal consistency, and acceptability. The guideline can then be tested in selected healthcare settings to see if it is feasible for use in routine practice. Finally the guideline

should be reviewed after a specified time period and modified to take into account new knowledge (Thomas, 1999:38). In this study the guidelines will be based on the research evidence from the quantitative and qualitative results but will not be tested.

The guidelines formulated to address training and implementation of the BANC package is:

- 6.4.1. Guideline One: Select and prepare the master trainer for BANC training and implementation
- 6.4.2. Guideline Two: Select and prepare the trainer of trainees for BANC training and implementation
- 6.4.3. Guideline Three: Implementation of the BANC package
- 6.4.4. Guideline Four: Monitoring and evaluation of the effect of the BANC package

The guidelines are described in table 6.1. below.

Table 6.1. Guidelines for the Effective Implementation of the BANC package

Rationale	Implementation
<p>6.4.1. Guideline One: Select and prepare the master trainer for BANC training and implementation</p>	
<p>The master trainer has to prepare the trainers of trainees to cascade the training and implementation of the BANC package at clinic level. The master trainer has to ensure learning transfer of new knowledge related to antenatal care. The master trainer supports and motivates trainers to complete the training and implementation of the BANC package and by so doing make the required changes at clinic level. The master trainer contributes to establish and maintain a cooperative learning</p>	<p>Select the master trainer:</p> <p>Select the master trainer by completing a situational analysis of a district to identify</p> <ul style="list-style-type: none"> * The number of master trainers required for the district * The number of clinics and therefore the number of BANC packages required <p>The master trainer should be an advanced and/or experienced midwife involved in antenatal care services. The master trainer should be in a supervisory position at district level with a responsibility to monitor the quality of antenatal care. The master trainer should have the time to train trainers of trainees. The master trainer should have the following characteristics:</p> <ul style="list-style-type: none"> * Motivated to improve the quality of antenatal services provided * Have training skills * Have good interpersonal skills * Be willing to learn and to train others as trainers of trainees

Rationale	Implementation
<p>climate (Gravett, 2001:37-45) by building trust and credibility. The master trainer has to be selected with this role in mind and has to be prepared to train others in the BANC package.</p>	<p>Train the master trainer:</p> <p>The master trainer should be prepared and trained by the Medical Research Council where the current knowledge and expertise for the BANC package is located. Training of the master trainer consists of a series of sessions namely:</p> <ul style="list-style-type: none"> * A session to orientate the master trainer to the current challenges in antenatal care and to train the person on the audit process and use of the audit tool. The baseline audit may also motivate the master trainer to effect changes to improve service delivery for pregnant women as gaps are identified during this process * Following this introductory session the master trainer has to return to her clinics and determine the quality of antenatal care, using the audit tool. This would be the baseline audit at the selected clinics identified for training and implementation of the BANC package. A period of approximately three months is allowed for the audit to be completed * With the baseline audit data available the training on the BANC package is done. A training session lasting three to five days is held to cover the content of the BANC package. This session includes practical skills and an assessment of the preparedness of the master trainer. During this session protocols are developed to complement the integrated flow charts of the BANC package. This session will be concluded by

Rationale	Implementation
	<p>allowing the master trainers to plan cascading the training to their clinics.</p> <ul style="list-style-type: none"> * A final session is held for feedback and a report back on successes and challenges experienced during the training and implementation of the BANC package. <p>Support the master trainer:</p> <p>Create support for the master trainer</p> <ul style="list-style-type: none"> * Involve the provincial Mother and Child Programme Manager to ensure support at district level. * Orientate clinic and hospital managers in the principles of the BANC package by holding an information session with relevant managers
<p>6.4.2. Guideline Two: Select and prepare the trainer of trainees for BANC training and implementation</p>	
<p>Participants found the material in the BANC package useful for training and implementation. The BANC package provides the material to direct a group of learners through learning tasks required for the</p>	<p>Select the trainer of trainees:</p> <ul style="list-style-type: none"> * Identify the clinics where a trainer of trainees is needed * Identify a professional nurse who may fulfill the role of trainer of trainees. This professional nurse should be a Registered midwife with experience in antenatal care, and not likely to resign, retire or be re-allocated to another section for at least 12 months.

Rationale	Implementation
<p>improvement of antenatal care. According to Gravett (2001:57) learning tasks serve as mediational tools within a dialogic teaching strategy and it structures dialogue with learners. Learning tasks call upon learners to interact with the content immediately (Gravett, 2001:62). The principles of adult learning (Gravett, 2001:1) integrated into the BANC package contributed to participants experiencing the training as positive with improved self-esteem and confidence in providing antenatal care. The format and content of the training in the BANC package exposed the participants to the latest developments and new evidence in</p>	<ul style="list-style-type: none"> * Contact the nursing service manager (clinic manager) to discuss training. Motivate the manager to support the trainer of trainees and inform the manager of the needs of the trainer. For example explain that the trainer will need time to be prepared for the training; she will need support to implement changes at clinic level and she will need resources for example the packages, antenatal cards and the checklist. Also explain the BANC supervision tool to assist the manager and or supervisor to monitor the quality of antenatal care provided. * Approach the selected person and gain co-operation by explaining the approach and the training requirements. Communicate the training programme with the dates and the venue. <p>Prepare the trainer of trainees:</p> <ul style="list-style-type: none"> * A training programme must be developed and negotiated with participants. * Arrange for the venue, catering and resource material to be ready at the time of starting the training. A BANC package must be available for each trainer of trainees at the start of the training. * Commence training and follow the sessions as set out in the Guideline for trainers. Training may be done in five three hour sessions alternate weeks, spread over ten weeks. This would provide weeks in between in which the trainers would be able to repeat the

Rationale	Implementation
<p>the provision of antenatal care.</p> <p>The trainers of trainees are tasked with the dual role of trainer as well as change agent. This role was experienced as difficult; the trainers therefore need to be carefully selected and trained for this role.</p>	<p>training at clinic level. Alternatively all sessions of the training may be presented over three full days training.</p> <ul style="list-style-type: none"> * Assess knowledge and skills by accompaniment of the trainer in the practical situation * The master trainer should arrange follow-up visits to individual clinics. It is advisable that the clinic supervisor accompany the master trainer on such a visit. During this visit the BANC evaluation tool may be used to assess the implementation. Further training needs may be identified and addressed. The master trainer will for example accompany a professional nurse trained by the trainer at clinic level to assess if the knowledge was cascaded to other staff working in antenatal care. An audit of three to five antenatal cards will provide information of the quality of antenatal care; it will also reveal the understanding of the BANC principles at clinic level. * Allow time at the end of the training for trainers of trainees to draft a training programme for implementation at clinic level.
<p>6.4.3. Guideline Three: Implementation of the BANC package</p>	
<p>The primary health care professional nurses involved with the training and implementation of the BANC</p>	<p>Step One: Make a decision to implement the BANC package to improve the quality of antenatal care at primary health care level. Implementation of the BANC Package is not a policy and is prompted by an awareness of poor quality of antenatal care matched with a</p>

Rationale	Implementation
<p>package experienced the training as positive and enjoyed the exposure to new information with the emphasis on antenatal care. The training materials were useful for training and implementation in practice, and facilitated learning transfer. Furthermore the improvement noted in the ‘interpretation and decisions’ section of the audit tool illustrated an improvement in the quality of care which may impact on the outcome of the pregnancy for the mother and her baby.</p>	<p>desire to improve care. The Saving Babies Report 2003 (Pattinson, 2004: 4-22) describes the situation of perinatal deaths in South Africa including rates, causes and avoidable factors. Further to this report the audit of antenatal cards using an audit tool (Philpott & Voce,2001:68-76) would provide the status of the quality of antenatal care at a specific clinic. This awareness of the status of the quality of care contributes to the motivation for change at managerial and clinic level and a decision to implement the BANC Package..</p> <p>Step Two: Incorporate BANC implementation into the provincial/district/sub-district plan. Implementation of the BANC package should be included in the strategic and operational plan at the most appropriate level. This would assist and support the availability of resources and set the platform for monitoring and evaluation</p> <p>Step Three: Implement BANC using a phased approach. The number of clinics would be determined by the quality of care that is the urgency to improve matched with the availability of resources. Starting with a few clinics would enable managers and clinic staff to become familiar with the new approach and address implementation issues, before rolling out to all clinics.</p> <p>Step Four: Select and prepare the master trainer</p>

Rationale	Implementation
	<p>The selection and preparation of the master trainer was discussed in Guideline One.</p> <p>Step Five: Preparation for training and implementation</p> <p>Preparation would include a number of steps namely</p> <ul style="list-style-type: none"> ◦ the orientation of relevant clinic and hospital managers ◦ the orientation of clinics staff to the planned implementation ◦ selection of staff to be trained as trainers of trainees ◦ preparation of the training material ◦ logistical arrangements <p>Step Six: Select and prepare the trainers of trainees</p> <p>The selection and preparation of the trainers of trainees was discussed in Guideline Two.</p> <p>Step Seven: Training and implementation of BANC.</p> <p>Step Eight: Monitoring and evaluation.</p> <p>Monitoring and evaluation is discussed in Guideline Four</p>

Rationale	Implementation
6.4.4. Guideline Four: Monitoring and evaluation of the effect of the BANC package	
<p>Acting as a trainer was experienced as difficult. The trainers were tasked with the dual role of trainer as well as change agent. The implementation of BANC is a change process requiring organizational change at primary health care clinic level to improve the quality of care. Organizational change is often a complex and difficult process (Boshoff, 2005:151). McKenna (1997:180) states that health care settings are particularly resistant to change. Although the value of supportive supervision with feedback (Rowe et al, 2005:1029) is known, evidence of such support and</p>	<p>The monitoring and evaluation may be achieved through:</p> <ul style="list-style-type: none"> * Supportive supervision: Support visits by the master trainer, accompanied by the clinic supervisor, to the clinics would assist to identify issues that may affect antenatal care. A support visit may be facilitated by the use of the BANC evaluation tool. The tool (Annexure E.5.), developed by the researcher, would structure the objective assessment of BANC during the supervisory visits and provide the means for written feedback to the clinic. Shortcomings and further training needs identified during the visit may then be discussed and redress planned together with clinic staff. The tool has not been tested during this study. * Continuous monthly audit: A number of antenatal cards may be audited every month to provide an indication of areas where further training is required as well as areas where improvement is evident. The result of the monthly audit is plotted on a graph at the clinic. This is then used to communicate results to all clinic staff. * Monitor pre-determined indicators: These may include the current indicators on the DHIS and the ongoing monthly audit results for example the percentage of women seen for the first visit before 20 weeks gestational age. The information from the BANC

Rationale	Implementation
<p>supervision was lacking in this study. Effective monitoring and evaluation may support the training and implementation as well as the facilitation of the required change in antenatal care services. Supportive supervision may also assist to reduce the dilution effect of cascade training.</p>	<p>evaluation tool could be summarized into a quarterly report. Presented at district and/or provincial level this would provide the current status of BANC implementation and the quality of antenatal care. Finally the perinatal mortality rate as captured in the PPIP programme and the DHIS may be used to determine a reduction in mortality.</p> <p>* Performance management system: A key responsibility area of the clinic supervisor and the professional nurse in charge of the primary health care clinic is the quality improvement of services. The BANC package will assist and support achievement of this key performance area.</p>

Table 6.1. Guidelines for the effective implementation of the BANC package

6.5. Limitations of the Study

The study focused on primary health care clinics in the Nelson Mandela Bay Metropole with five selected clinics for intervention.

- These five clinics are not representative of primary health care in rural areas.
- The focus was mainly on the professional nurses providing care whereas in the primary health care setting there are many different role players who may contribute to the quality of care a pregnant woman receive.
- The sample of five clinics is a small sample therefore findings cannot be generalised
- Improvement in experimental groups were limited, making it difficult to interpret the effectiveness of the BANC Package to improve the quality of antenatal care.

6.6. Conclusion

Patients can be satisfied with low quality care and dissatisfied with high quality care. Satisfaction depends primarily on being treated with respect and involved in treatment decisions whereas quality of care is a combination of patient satisfaction and technical competence (Larson & Muller, 2002:275). The World Health Report 2005 (WHO, 2005b:42) argues that the most important components of care during pregnancy are first, providing good antenatal care, second, avoiding or coping with unwanted pregnancies, and third, building societies that support women who are pregnant. Increased coverage of antenatal care in the last decade provides the opportunities for care that should not be missed namely to promote healthy lifestyles that improve long-term outcomes for women, to establish a birth plan and to prepare mothers for parenting. Antenatal care has come a long way, but can go much further. Four directions are critical that is to rationalize the rituals of care, to roll out antenatal care as a platform for a number of other key health programmes, to establish communication with women more effectively and to avoid the over medicalization that can do more harm than good (WHO,2005b:47).

Pregnancy is not just a matter of waiting to give birth. Often a defining phase in a women's life, pregnancy can be a joyful and fulfilling period. It can also be one of misery and suffering, when the pregnancy is unwanted or when complications or adverse events compromise the pregnancy, cause ill-health or even death. Pregnancy may be natural but that does not mean it is problem free. Women rely on the health service for care and information during this crucial time (WHO, 2005b:41).

The implementation of the BANC package can assist to re-organise services at primary health care level to optimise the impact of the professional nurses to improve the quality of care to pregnant women. With consistent use of the integrated approach included in the BANC package a difference may result in the outcomes of pregnancy and the health and survival of the woman and her newborn baby.

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