AN EVALUATION OF THE KNOWLEDGE OF THE REGISTERED MIDWIVES MANAGING HYPERTENSIVE DISORDERS AT PRIMARY HEALTH CARE LEVEL IN THE EASTERN CAPE

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DECLARATION

By submitting this research assignment electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the authorship owner thereof and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Signature: Date: 4 February 2010

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ABSTRACT

Hypertensive disorders are one of the leading causes of maternal morbidity and mortality in South Africa. The morbidity and mortality rate can be decreased by early detection and management of hypertensive disorders at primary health care Level. The midwives should therefore be knowledgeable and competent in the assessment and diagnosis of pregnant women who are at risk of developing a hypertensive disorder, and be able to manage the problem.

The purpose of the study was to investigate scientifically the knowledge of the registered midwives managing hypertensive disorders in pregnancy working at primary health care level in the Eastern Cape.

The objectives set for the study were to investigate the knowledge of the registered midwives in the following areas:

- Knowledge about hypertensive disorders
- Assessment
- Diagnosis
- Management

A descriptive correlational research design was applied with a quantitative approach to investigate scientifically the knowledge of the registered midwives managing hypertensive disorders in pregnancy. The target population included all the registered midwives working permanently in primary health care clinics in the Buffalo City Local Service Area. A stratified random sample of n=43 (44%) of a population of N=98 clinics both in rural and urban were selected together with a sample of n=101(44%) of N=228 registered midwives working in these clinics. A questionnaire consisting of predominantly closed questions was used for the collection of data, collected personally by the researcher. Ethical approval was obtained from Stellenbosch University, Department of Health and individual informed consent. A pilot study, which did not form part of the study, was conducted to test the questionnaire at the clinics. A 10% (n=10) sample of the registered midwives of 4 clinics participated in the pilot study. The validity and reliability was assured through the pilot study, the use of a statistician, as well as experts in midwifery, nursing and a research methodologist.

The data was analysed and presented in tables and histograms. Statistical correlational tests were done to determine any correlations between the variables. Findings obtained show that inadequate knowledge exists among participants with specific reference to knowledge, assessment, diagnosis and management about hypertensive disorders. A statistical correlation was shown between the

presence of doctors and the knowledge of the midwives using the Mann-Whitney statistical test (p=0.04). In clinics where there are no doctors' visits, the knowledge of the staff was higher (0.691), than the total knowledge mean score (0.666). Where doctors are regularly visiting the clinics the mean knowledge score is lower (0.656). These results show that where midwives do not have any additional support as when there are doctors present, individual effort is made to keep up to date as they are practising as independent practitioners.

Recommendations are based on the scientific evidence which emphasis further education in advanced midwifery, workshops, conferences, updating their knowledge and weekly in-service training, introduction of a quality assurance and patient education programmes.

In conclusion empowering the midwives with the required knowledge about hypertensive disorders will contribute towards decreasing the mortality and morbidity rates.

OPSOMMING

Siektetoestande gekoppel aan hipertensie is een van die vernaamste oorsake van sieklikheid en moedersterftes in Suid-Afrika. Die siektetoestand en sterftekoers kan afneem deur vroeë opsporing en bestuur van hipertensietoestande op primêre gesondheidsorgvlak. Die kraampersoneel behoort dus kundig en bekwaam te wees tydens die assessering en diagnose van swanger vroue wat die risiko loop om 'n toestand van hipertensie te ontwikkel en daartoe in staat te wees om die probleem te kan hanteer.

Die doel van die studie is om die kennis van geregistreerde vroedvroue wetenskaplike te ondersoek wat hipertensiewe toestande tydens swangerskap hanteer op Primêre Gesondheidssorgvlak in die Oos-Kaap.

Die doelstellings wat uiteengesit is vir die studie, is om die kennis van geregistreerde kraampersoneel in die volgende areas te ondersoek:

- Kennis van hipertensiewe toestande
- Assessering
- Diagnose
- Hantering.

'n Beskrywende korrelerende navorsingsontwerp is toegepas met 'n kwantitatiewe benadering om die kennis van die geregistreerde kraampersoneel wat hipertensiewe versteurings in swangerskappe hanteer, wetenskaplik te ondersoek. Die teikengroep het al die geregistreerde kraampersoneel wat permanent in die primêre gesondheidssorgklinieke in die Buffalo City Plaaslike Diensarea werk, ingesluit. 'n Gestratifieerde ewekansige steekproef van n=43 (44%) gekies uit 'n gesamentlike plattelandse en stedelike bevolking van N=98 klinieke met 'n steekproef van n=101 (44%) van N=228 geregistreerde vroedvroue wat in die klinieke werk. 'n Vraelys wat hoofsaaklik uit geslote vrae bestaan, is gebruik vir die insameling van data wat persoonlik deur die navorser ingesamel is. Etiese toestemming is verkry van die Universiteit Stellenbosch, die Departement van Gesondheid asook individuele ingeligte toestemming. 'n Loodsondersoek is uitgevoer om die vraelys te toets by die klinieke wat nie deel van die studie was nie. 'n 10% (n=10), steekproef van die geregistreerde vroedvroue van 4 klinieke het deelgeneem aan die loodsondersoek. Die geldigheid en betroubaarheid is verseker deur die loodsondersoek, die gebruik van 'n statistikus asook kundiges in kraamverpleging en 'n navorsingsmetodoloog.

Die data is geanaliseer en weergegee in tabelle en histogramme, statistiese korrelasietoetse is gedoen om korrelasies te bepaal tussen die veranderlikes. Die bevindings, bewys dat

ongenoegsame kennis bestaan by deelnemers met spesifieke verwysing na kennis, assessering, diagnose en hantering ten opsigte van aangaande toestande van hipertensiewe toestande. ’n Statistiese korrelasie is getoon tussen die teenwoordigheid van geneeshere en die kennis van vroedvroue deur gebruik te maak van die Mann-Whitney statistiese toets ($p=0.04$). In klinieke waar daar geen doktersbesoeke is nie, is die personeelkennis beter (0.691) as die totale gemiddelde kennistelling (0.666). Waar geneeshere gereeld die klinieke besoek, is die gemiddelde kennistelling laer (0.656). Hierdie resultate bewys dat waar die vroedvroue geen bykomende ondersteuning deur die teenwoordigheid van geneeshere het nie, het individuele moeite gedoen om op die hoogte te bly, aangesien hulle as onafhanklike praktisyns optree.

Aanbevelings is gebaseer op wetenskaplike bewyse wat verdere onderrig beklemtoon in gevorderde kraamverpleging, werkswinkels, konferensies, die bywerk van kennis en weeklikse indiensopleiding, die instel van ’n kwaliteitsversekering en opvoedingsprogramme vir pasiënte.

Ten slotte die bemagtiging van vroedvroue wat oor die vereiste kennis beskik van toestande van hipertensiewe toestande, sal bydra tot die afname van sterfte- en siektesyfers.

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CHAPTER 1: SCIENTIFIC FOUNDATION FOR THE STUDY

1.1 INTRODUCTION

An increase in maternal mortality has become a national issue for midwifery. Maternal mortality can be defined as the death of a woman while pregnant or within 42 days of termination of pregnancy. This is irrespective of the duration of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from its accidental or incidental causes (World Health Organization, 2005:4).

In South Africa, according to the Confidential Enquiry Report into Maternal Deaths, the national statistics of 2002 to 2004 reports a 48% morbidity and 19.1% mortality rate. The main causes of maternal mortality and morbidity are hypertensive disorders (Strategic Plan of Department of Health, 2004:17). According to Lowdermilk and Perry (2007:785), hypertension is the second leading cause of maternal and perinatal morbidity in the United States of America. In the UK hypertensive diseases of pregnancy remains the second leading cause of direct maternal deaths (Patient United Kingdom, 2006:2-3).

The National Department of Health's (NDoH) goals for child health are guided by

international child health goals, including the reduction of infant and child mortality and morbidity. Targets have been set according to the millennium development goals which include reducing child / infant mortality rate (IMR) by two thirds between 1990 and 2015 (Strategic Plan of Department of Health, 2005). According to the South African midterm report on the Millennium Development Goals objectives also include reducing the neonatal mortality rate (NNMR) from 20 to 14 per 1 000 live births, ensuring that the national IMR does not exceed 45 per 1000 live births and reducing the national U5MR to 59 per 1000 live births .

The goal of the Department of Health in the Eastern Cape is aligned to the NDOH's goals and that is to decrease morbidity and mortality rates in the province. These goals could be achieved through strategic interventions by improving the quality of care and promoting integration of government interventions at all levels of the Health System to ensure synergistic and effective service delivery (National Committee For The Confidential Enquiry into Maternal Death,1999-2004:19).

1.2 RATIONALE

The incidence of hypertensive disorders in the Eastern Cape Buffalo City Local Service Area is 19.2% of which approximately 5% developed eclampsia (Strategic Plan of the Provincial Department of Health, 2001-2004:17).

Hypertensive disorders are one of the leading causes of maternal morbidity and mortality in South Africa (National Maternity Care Guidelines Committee of the Department of Health, 2003:56). According to the statistics of the Eastern Cape Department of Health the percentage of maternal mortality and morbidity rate due to hypertensive disorders is 53% (Strategic Plan of the Provincial Department of Health, 2004-2007:19).

During clinical accompaniment of the midwifery students i.e. students following the four year diploma and one year programme respectively, it was observed that a high incidence of hypertensive disorders exist amongst the pregnant women in the Buffalo City Local Service Area in Amathole District Municipality. This is supported by the following statistical evidence obtained at an antenatal clinic as shown in table 1. 1.

The total attendance for 2004 was 7219, of which 12% (872) of all patients were hypertensive.

The total attendance of the patients who attended for 2005 was 5924 of which 19.5% (1158) of the patients were hypertensive.

Over a period of eight months, January 2006 - August 2006, 5353 patients attended the antenatal clinic of which 18.8% (1008) of all patients were hypertensive. These statistics show a marked increase in patients diagnosed with hypertensive disorders. According to the National Committee for the Confidential Enquiry into Maternal Deaths (1999:-2001:71), mortality rate can be decreased by early detection and management of hypertensive disorders at primary health care level. The midwives should therefore be knowledgeable and competent in the assessment and identification of pregnant women who are at risk of developing hypertensive disorders and in the management of those who have been identified.

Table 1.1: Patients diagnosed with hypertension for the period 2004-August 2006

Period	Patient Attendance	Diagnosed with Hypertension
2004	7219	872 (12%)
2005	5924	1158 (19.5%)
Jan 2006-Aug 2006 (8 months)	5353	1008 (18.8%)

World-wide hypertensive disorders have an adverse effect on maternal morbidity and mortality, as well as on fetal and infant mortality as shown in various studies. Chhabra and Kakani (2007:25), state that hypertensive disorders continue to be a major cause of maternal and fetal morbidity and mortality rates. It accounts for many admissions, labour inductions and operative intervention for complications in order to reduce mortality. Supported by Gómez, Martínez, Figueras, Del Río Borobio, Puerto, Coll, Cararach, Vanrell (2005:490), hypertensive disorders and associated complications are responsible for a significant proportion of perinatal and maternal morbidity and mortality during pregnancy. Furthermore, it was identified in the Caribbean that hypertensive disorders is the major contributor to maternal deaths. The reduction of maternal deaths is a high priority for the international community, especially in view of the increased attention on the Millennium Development Goals (Khan, Wojdyla, Say, Gülmezoglu and Van Look**,** 2006:1066). In Africa, hypertensive disorders are also contributing adversely to the maternity mortality and morbidity, as identified in a study in Sudan, to be the main contributing factor to maternal mortality. The researchers also found that hypertensive disorders of pregnancy decreased to 8.4%, due to better antenatal care (Dafallah, El-Agib and Bushra, 2003:369-372).

Observations made by the researchers in the Indian rural regions showed that 32.2% of the perinatal loss was as a result of hypertensive disease. In this study perinatal mortality is mostly associated with low birth weight, which could be because of spontaneous or induced preterm delivery for fetal, maternal or feto-maternal reasons (Chhabra, Qureshi and Datta, 2006:532).

According to Moodley (2004:247), there were 507 deaths associated with hypertensive disorders of pregnancy in South Africa during the period 1999-2001. Most deaths from eclampsia occurred at parity of 0, namely 51%. He identified factors that played a major role in mismanaging hypertensive disorders of pregnancy, such as delay in referral due to unavailability of transport, lack of protocol for the management of eclampsia and failure to follow clinical protocols of care all contributed towards avoidable medical factors. In addition he also identified in a population based study in Durban hypertensive disorders which contributed to 12% of all cases seen, which were aggravated by various problems such as administrative problems, lack of transport to clinics, barriers to access health care facilities, lack of accessibility, such as a lack of termination of pregnancy and a lack of appropriately trained staff. In this study it was shown that the age groups mostly affected are: 22.8% were 20 years of age, 47% were 24 years of age and 58.6% were between ages of 25 and 34 years.

Hypertension complications occur in 8% to 10% of all the pregnancies and contribute significantly to maternal and neonatal morbidity and mortality worldwide (Mugo,Govindarajan, Kurukulasuriya, Sower and Mcfarlane, 2006:348-350). Ideally, prediction, detections and prevention of severe pre-eclampsia reduces morbidity and mortality. This is further substantiated by Zareian (2004:194-

198), who emphasised that more attention is required to assess pregnant women by detecting and preventing the complications..The hypertensive disorders of pregnancy commonly complicate pregnancy and have great influence on maternal and neonatal morbidity and mortality rates. Furthermore, hypertensive disorders of pregnancy, pre-eclampsia and gestational hypertension are associated with increased risk of future chronic hypertension (Wolf, Shah, Jimenenz- Kimble, Sauk, Ecker and Thadhani, 2004:1330-1338).

Peters and Flack (2003:209), conclude that nurses working in outpatient, home care and acute care settings, must be vigilant when assessing pregnant women so that hypertensive problems are identified early and treated promptly. Furthermore, nurses must have knowledge about the procedures required to ensure accuracy and make informed decisions based on this knowledge. Adequate management of these women will promote safe and healthy deliveries. Prevention of hypertensive disorders in pregnancy requires nurses to use their assessment, advocacy and counseling skills.

In a study of 615 patients affected by hypertension during pregnancy, findings showed that 347 cases were diagnosed with severe pre-eclampsia and 132 cases were diagnosed as HELLP (Haemolysis, elevated liver and low platelet count) syndrome. The findings of this study showed that approximately 2% to 5% of all pregnancies are complicated by pre-eclampsia, with hypertensive disorders being a main cause of maternal morbidity and mortality. All these findings point out that timely diagnosis and appropriate intervention is lifesaving and can improve maternal and fetal outcomes (Gul, Aslan, Cebeci, Polat, Ulusoy and Ceylan, 2004:557-562).

It was identified in the literature and observed in the clinical environment that various treatment measures are recommended to manage hypertensive disorders.

Emery (2005:348), suggests magnesium sulfate for prevention and arresting of eclamptic seizures. Repke, Power, Holzman and Schulkin (2002:472), found success in the use of low-dose aspirin and calcium supplements during the antenatal period and magnesium sulfate during labour. In addition Patient United Kingdom (2006:2-3), also found that low dose aspirin and calcium supplementation appear to reduce the risk of high blood pressure in pregnancy.

However, antihypertensive drugs are used solely to prevent maternal morbidity and have no effect on disease progression. Frishman,, Schlocker, Award and Tejani (2005:274), propose that calcium supplements can reduce the incidence of pre-eclampsia, while others have investigated the use of vitamin C and E to prevent pre-eclampsia in woman at high risk. Mugo, Govindarajan, Kurukulasuriya, Sowers and Mcfarlane (2006:348-350), in their studies found both vitamins C and E to reduce rates of pre-eclampsia in patients with abnormal uterine doppler studies.

Hydralazine and methyldopa are used in combination, as methyldopa has an adverse effect to the side effects of hydralazine. Zareian (2004:194-198), also supports the use of hydralazine and magnesium sulfate.

McCaw-Binns, Ashley, Knight, MacGillivray and Golding (2004:286-294), developed strategies to prevent eclampsia in a developing country. This study was aimed at reducing maternal morbidity and mortality. Effects of these strategies developed for prevention of hypertension in pregnancy resulted in a dramatic reduction in admission for pre-eclampsia, with a subsequent drop in the number of bed days used for eclampsia. Primary health care level antenatal clinics had clear instructions for referring patients to a high risk antenatal clinic or to a hospital which included the following:

- Guidelines provided to high risk clinics and antenatal wards for appropriate treatment of hypertension and eclampsia.
- Midwives,trained in primary health care, public health nurse and community health aids to identify and follow up women at risk of developing hypertension in pregnancy.
- Posters and books providing information to pregnant women ..
- Guidelines issued to midwives on techniques of taking blood pressure and doing a urine analysis.
- Frequent meetings held with midwives to feed information back to the staff and facilitate the exchange of information between primary and secondary health care level in order to solve problems as they were identified.
- The private practitioners provided with information to ensure early referral of woman with signs of hypertension or pre-eclampsia.
- Furthermore, it is imperative that all women should receive antenatal education so that they are aware of the symptoms associated with pre-eclampsia. Alcohol and tobacco use should be strongly discouraged (Patient United Kingdom, 2006:2-3).

1.3 PROBLEM STATEMENT

On the basis of the above information it appears that there could be a deficit in the knowledge of the professional registered midwives about the assessment, diagnosis and management of the hypertensive disorders in pregnant women. It is therefore imperative to evaluate scientifically the knowledge of the midwives working at primary health care level regarding the knowledge, the assessment, diagnosis and management of hypertensive disorders in pregnancy.

1.4 RESEARCH QUESTION

As a departure point for this study, the researcher poses the question; “Do the registered midwives, working at primary health care level, have adequate knowledge of the management of hypertensive disorders in pregnancy?”

1.5 GOAL

The purpose of this study is to investigate scientifically the knowledge of the registered midwives managing hypertensive disorders in pregnancy working at primary health care level in the Buffalo City Local Service Area of the Eastern Cape.

1.6 OBJECTIVES

To determine whether the registered midwives working in primary health care have adequate knowledge about

a. hypertensive disorders in pregnancy
b. the assessment of hypertensive disorders in pregnancy
c. the diagnosis of hypertensive disorders in pregnancy
d. the management of hypertensive disorders in pregnancy.

1.7 RESEARCH METHODOLOGY

1.7.1 Research design

A descriptive correlational non-experimental research design will be applied with a quantitative approach to investigate scientifically the knowledge of the registered midwives managing hypertensive disorders in pregnancy and working at primary health care level in the Eastern Cape. According to Burns and Grove (2009: 696; 2007:537), a research design is a “blueprint” for conducting a study which ensures the validity of the findings by maximizing the control over factors that could influence it. A correlational design is described as a systematic investigation of relationships between or among variables (Burns and Grove, 2007:25).

During this study the actions and knowledge of registered midwives in relation to management of hypertensive disorders will be described.

1.7.2 Population and Sampling

Population is a collection of objects, events or individuals having some common characteristics that the researcher is interested in studying (Mouton 1996:134).

Sampling is a process in which representative units of a population are selected for study in a research investigation (LoBionda-Wood and Haber: 2006:572).

As shown in tables 1.2 and 1.3 Region C in the Eastern Cape consists of 98 clinics which include rural and urban clinics in the Buffalo City Local Service Area. A random sample of 43 clinics (44%), will be drawn from the total number of clinics. The researcher will use 28 clinics from the rural area and 15 clinics from the urban area. The clinics will be drawn randomly from a list of all the clinics, drawing every second clinic on the list until the desired number is obtained. The target population for this study is the registered midwives allocated in these clinics. In the rural clinics 2 registered midwives (RM), are allocated and in urban clinics 3 registered midwives are allocated per clinic. The total population of the registered midwives working in the Buffalo City Local Service Area is 228. The stratified random sample to be selected is 101 (44%) of the total population of the registered midwives. Guided by the statistician a sample of at least 100 registered midwives is required.

Table 1.2: Population and sampling of urban clinics and midwives

Clinics	Population (N)	Sample (n)	Population of RM (N)	Sample of RM (n)
Buffalo Municipality	28	13(47%)	84	40 (48%)
Mdantsane	4	2(40%)	12	5 (42%)
TOTAL N	32	15(47%)	96	45(47%)

Table 1.3: Population and sampling of rural clinics and midwives

Clinics	Population (N)	Sample (n)	Population of RM (N)	Sample of RM (n)
Mdantsane	11	5 (45%)	22	11(50%)
Peddie	23	9 (39%)	46	18 (39%)
Bisho	23	9 (39%	46	18 (39%)
East London	9	5 (55, 6%)	18	9 (50%)
TOTAL (N)	66	28 (42%)	132	56 (42%)

1.7.3 Pilot study

A pilot study attempts to test the instrument for ambiguity and accuracy and is a trial run done in preparation for a major study (Polit & Hungler, 2001:467). According to LoBiando-Wood and Haber

(2006:569), it is a smaller version of the actual study conducted as a prelude to a larger scale study, but is often called the “parent study”. Furthermore, the purpose of the study is to test the instrument for any inaccuracies, ambiguity and to assess the feasibility of the study. Only 10% of the actual sample is required as described in De Vos, Strydom, Fouche and Delport (2002:210).

In addition as described by Burns and Grove (2009:44), a pilot study assists to develop or refine the research methodology, data collection and supports the reliability and validity of the research instrument.

For this study a pilot study will be conducted in four primary health care clinics in April 2009. A stratified sample of 10 (10%) participants will be randomly selected based on the actual size of the sample of the study, These participants and clinics will not form part of the actual study.

1.7.4 Reliability and Validity

Reliability of a study represents the consistency of the measure obtained while validity is the measure of the truth or accuracy of a claim. This is an important aspect throughout the research process (Burns & Grove, 2009:718- 727).

A statistician was consulted with the design of the questionnaire, to assist with the planning of the data analysis and will be consulted throughout the study. Midwifery experts and a research methodologist were consulted to evaluate the content validity of the instrument. The reliability and validity of the study will be further assured by distributing the same instrument to 10 registered midwives during a pilot study. Furthermore, the researcher will collect all data personally.

1.7.5 Instrumentation

According to Burns and Grove (2009:704), instruments are measuring tools which adhere to specific rules when being developed,for example questions should be accurately stated with no ambiguity. A structured questionnaire was designed based on an intensive literature review and the researcher’s clinical experience. It consisted of specifically closed questions. The questionnaire (Annexure A) was divided into various sections namely :

- Biographical data: age, qualifications, gender and experience
- Knowledge and diagnosis of hypertensive disorders: Different definitions of hypertensive disorders, risk factors of hypertensive disorders and effects
- Assessment: Medical and social history, clinical manifestations, physical examination, and diagnostic tests
- Management of hypertensive disorders including prevention and treatment.

1.7.6 Data Collection

According to Burns and Grove (2007:536), data collection is the systematic gathering of information relevant to the research papers or specific objectives, questions or hypothesIs.

For the purpose of this study the researcher will collect all data personally by handing out a structured questionnaire to individual participants and collecting it after completion in a sealed envelope. The data will be collected over a period of 4 weeks.

1.7.7 Data analysis and Interpretation

A statistician was consulted prior to application for ethical approval. The plan for the data analysis was based on the questionnaire with the support of Prof Kidd..It was decided that the data will be presented as frequencies, graphs and tables where applicable. Various statistical tests such as Spearman and Mann-Whitney tests will be applied to determine possible associations between variables.

1.8 ETHICAL CONSIDERATIONS

Consent was obtained from the Eastern Cape Department of Health, Annexure C and the Human Science Ethical Committee at the University of Stellenbosch (Annexure B) . Informed written consent (Annexure D) will be obtained from all participants. Confidentiality and anonymity will be assured. All data will be managed confidentially and will only be accessible to the researcher. It will be discarded five years after completion of the study.

1.9 RECOMMENDATIONS

Recommendations based on the scientific evidence will be made to the Eastern Cape Department of Health. The results of the study will be made available to all relevant parties involved in the study and will be publish. and be presented at research conferences.

1.10 OPERATIONAL DEFINITIONS

Chronic hypertension is diagnosed before 20 weeks of gestation (Lowdermilk & Perry, 2007:786).

Eclampsia is the onset of seizure activity or coma in the woman diagnosed with pre-eclampsia with no history of existing pathology (Lowdermilk & Perry, 2007: 786).

Maternal mortality: can be defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from its accidental or incidental causes (World Health Organization, 2005:4).

A **midwife** is a person who is qualified and competent to independently practise midwifery in the manner and to the level prescribed and who is capable of assuming responsibility and accountability for such practice and registered as such in terms of section 31 (South African Nursing Council Act No 33 2005:5).

Morbidity refers to an illness or abnormal condition (Mosby's Medical, Nursing and Allied Dictionary, 2002:1120).

Pre-eclampsia refers to a pregnancy specific syndrome in which hypertension develops after twenty weeks of gestation in a previously normotensive woman, characterized by the presence of hypertension and proteinuria (Lowdermilk & Perry, 2007:785).

Pregnancy is the gestational process, comprising the growth and development within a woman of a new individual from conception through the embryonic and the fetal periods to birth (Mosby's Medical, Nursing and Allied Dictionary, 2002:1389).

Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology, made universally accessible to individuals and families in the community, through their full participation and at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self-determination (Smeltzer & Bare,2000:489)

1.11 STUDY OUTLAY

Chapter 1: In this chapter the scientific foundation of the study is discussed with an in-depth overview of the research methodology to be followed.

Chapter 2: A literature review is discussed based on the hypertensive disorders.

Chapter 3: The research methodology as planned and discussed in chapter 1 is described as implemented. Any limitations to the study are described, actual duration of collection of data and interviews are discussed.

Chapter 4: Data analysis, interpretation discussion of the findings are described. Data is presented in frequencies, tables or graphs. Various statistical associations between variables are also described.

Chapter 5: Various recommendations based on the scientific evidence are described.

1.12 CONCLUSION

In this chapter the rationale based on deductive and inductive reasoning, supported with the literature, problem statement, research question, goal, objectives and research methodology for the study is described.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The literature reviewed and presented in this chapter focused on the literature which deal with the framework of this particular study. The reviewed literature helped to predict the success of the proposed study, and to identify a need for further research in this particular area. The literature also provided the researcher with a context for examining the problem under study.

2.2 HYPERTENSIVE DISORDERS IN PREGNANCY

According to Leerners, Neumaier-Wagner, Kuse, Irawan, Imthurn and Rath (2005:442), hypertensive diseases in pregnancy are one of the leading causes of fetal and maternal morbidity and mortality. Twenty percent of perinatal deaths in the United States of America with a well established medical system occur as a result of hypertensive diseases in pregnancy. In their study it was shown that women who develop hypertensive diseases in pregnancy may have characteristic features in their family structure as a child.

Chhabra and Kakani (2007:25-29), has reported that worldwide between 40000-70000 maternal deaths occur annually due to severe pre-eclampsia and eclampsia.

Substantiated further, Khan, Wojdyla, Say, Gulmezoglu and Van Look (2006:1066), identified in their studies that hypertensive disorders is the major contributor to maternal deaths. They emphasised that the reduction of maternal death is a high priority for the international community, especially in view of the increased attention on the Millennium Development Goals. Their study also confirms that hypertensive disorders during pregnancy are among the leading causes of death with a rate of 9.1% in Africa.

2.3 TYPES OF HYPERTENSIVE DISORDERS IN PREGNANCY

2.3.1 Gestational hypertension and chronic hypertension

Blood pressure ≥140/90 mmHg after or before 20 weeks of gestation on two occasions ≥6 hours apart. According to Leeners, Neumaier-Wager, Kuse, Irawan, Imthurn and Rath, (2005:442),as well as Lowdermilk and Perry, (2007:787).

2.3.2 Pre-eclampsia

Pre-eclampsia is defined as gestational hypertension or chronic hypertension with second degree proteinuria ,≥ 0,3g/L in 24 hour urine specimen or dipstick proteinuria score ≥+ in random urine collection (Leeners, Neumaier-Wager , Kuse, Irawan, Imthurn and Rath, 2005:442). These findings are in line with the findings of Emery (2005:346), Coleman (2001:17), Molvarec, Prohaszka, Nagy, Szalay, Fust, Karadi and Rigo (2006:780); Florio, Torricelli, De Falco, Leucci, Giovannelli, Gazzolo, Severi, Bagnoli, Leoncini, Linton, and Petraglia (2006:1831).

2.3.3 Eclampsia

Emery (2005:346), defined eclampsia as a new onset of grand-mal seizures in a woman with pre-eclampsia, and is supported by Frishman et al. (2005:274), Peters and Flack (2003:209), Sellers (1997:1162), Zhang, Meikle and Trumble (2003:211).

2.3.4 Pregnancy induced hypertension

Pregnancy induced hypertension is defined as an increase in diastolic blood pressure of 20 mmHg or more from that recorded at the first antenatal visit, on at least two occasions during the course of pregnancy (Ellison, De Wet, Matshidze & Cooper 2000:77). This definition is supported by Peters and Flack (2003:209), Dafallah, El-Agib and Bushra (2003:369) and Roberts, Algert, Morris, Ford and Henderson-Smart (2005:333).

2.4 FACTORS CONTRIBUTING TO HYPERTENSIVE DISORDERS IN PREGNANCY

Various factors that contribute to the development of hypertensive disorders during pregnancy as described by various authors:

2.4.1 Gravity and parity

It has been identified that the primigravida has a higher risk of developing a hypertensive disorder than the multiparous pregnant woman(Sellers, 2005:1172).

The longer a woman lives with the partner or father of the baby before becoming pregnant, the lower the risk of developing a hypertension disorder due to lower levels of stress. Furthermore, the risk is also increased in multiparous women who become pregnant by a new partner (Emery, 2005:347). These findings are aligned with the findings of Thelma and James (1999:17), Cundy, Slee, Gamble and Neale (2001:482).

2.4.2 Medical Conditions

According to Andreasen, Andersen and Schantz (2004:1023), obesity increases the risk of pregnancy induced hypertension, which is substantiated by the findings of Thelma and James (1999:17) and Cundy et al. (2001:482). In addition they also referred to other medical conditions which contribute to the development of a hypertensive disorders in pregnancy such as renal, previous or existing hypertension, type 2 diabetes, family history, trophoblastic disease and hydrops fetalis.

It was also identified that women who have had a previously growth restricted baby are more likely to develop pre-eclampsia, including women with mildly impaired glucose tolerance, not requiring treatment are also at increased risk of developing hypertension in pregnancy (Myers & Baker, 2002:120).

2.4.3 Demographic Data

2.4.3.1 Race

Black women were shown to be at a substantially higher risk for developing pre-eclampsia versus women of other races, these findings are supported by Cundy et al, (2001:482).

2.4.3.2 Socio-economic level

Yucesoy, Ozkan, Bodur, Tan and Caliskan, (2005:349), state that those of low socio economic status, especially the young women, are at risk of developing pre- eclampsia. Their study revealed that most of these women had no regular antenatal visits and were of low socio economic status and from rural regions. However, a study done by Wolf et ali (2004:334), opposed the statement by Mugo, et al (2005:349), that low socio-economic status is a risk factor in developing hypertensive disorders. Their study states that there is no evidence that low socio-economic status or insufficient access to prenatal care affected risk of disease.

2.4.3.3 Life style

According to Leeners, Neumaier-Wagner, Kuse and Rath (2006:1217), smoking contributes to the development of a hypertensive disorder. This statement is supported by Cundy et al. (2001:482), Sellers (1997:1163) and Emery (2005:346).

2.4.3.4 Stress

Stress resulting from home duties are shown to be a significant independent risk factor for pregnancy hypertension and superimposed pre-eclampsia, including being unemployed . This is in

contrast with some studies that suggest that , physical and psychological work stress could represent a risk factor (Heard, Dekker,Chan,Jacob, Vreeburg&, Priest 2004: 42).

According to Yucesory et al. (2005: 47), women living in rural regions experience their first convulsions mostly at home due to the lack of community health education.

2.4.3.5 Late Admission to Health Facilities

Late admission to health facilities and improper anticonvulsive prophylaxis could result in intracranial bleeding, septic shock and cardiopulmonary arrest as shown in a study by Yocesory et al. (2005: 47).

2.5 PATHOPHYSIOLOGY

Peters and Flack (2003:212), describe the pathophysiology of pre-eclampsia in two stages:

2.5.1 Alteration in placental perfusion

Pre-eclampsia begins with placental changes. Normally the endovascular trophoblast cell of the placenta is supported to transform spiral arteries in the uterus to accommodate increased blood flow. In pre-eclampsia the arterial transformation is incomplete and women with the condition have a distinctive lesion terminal acute atherosclerosis, as well as a greater degree of placental infarction than is seen in normotensive gravidas, both of which can lead to decreased placental perfusion and placental hypoxia.

2.5.2 Maternal syndrome

The maternal syndrome begins when the plasma volume is reduced as compared to normal pregnancy with decreased blood flow to organs other than the placenta resulting in haemoconcentration, haemorrhage and causing necrotic changes in the kidneys, including swelling of the glomerular endothelial cell cytoplasm. This causes a glomerular endotheliosis which correlates with proteinuria. Both the renal blood flow and glomerular filtration rate are decreased in pre-eclampsia. Uric acid clearance and renal calcium are affected, resulting in hypoglycaemia and elevated serum urate levels.

Liver damage may be mild with elevated serum enzymes. There is an increase in microvascular fat deposition within the liver, which directly correlates with plasma uric acid levels and inversely correlates with platelet counts. Expansion of the liver parenchyma secondary to fat deposition is postulated as one cause of epigastric pain seen in severe pre-eclampsia.

Convulsions indicate that the central nervous system is involved, which results in seizures due to hypertensive encephalopathy. Vasoconstriction causes widespread microvascular cerebral changes and ischaemia may result in seizures. All current literature by Mugo,et al (2005:349), Emery (2005:347), Thelma and James (1999:17), Frishman, Schlocker, Awad and Tejani (2005,:275),as well as Duley (2003:163), support the above findings.

2.6 CLINICAL MANIFESTATIONS

2.6.1 Blood pressure

A study done by Peters and Flack (2003:213), indicates that clinical manifestations differ depending on the severity of the condition. They described mild pre-eclampsia as a mild elevation in blood pressure systolic, ≥140mmHg or diastolic ≥90. Frishman et al (2005:275) , agree that severe pre-eclampsia is manifested by elevated blood pressure of systolic ≥160mmHg or diastolic ≥ 110mmHg.

2.6.2 Blood tests

According to the study by Peters et al. (2003:213), increasing serum creatinine (>2mg/dL), rapid increase in platelet count (<100,000/mm) and or evidence of microangiopathic hemolytic anaemia, with increased lactic acid dehydrogenase indicate severe pre-eclampsia. This is substantiated by the findings of Emery (2005:348).

2.6.3 Urinalysis

Both Coleman (2001:17) and Peters et al. (2003:213), agree that proteinuria is a sign of hypertension when excretion is more than 3mg/24 hours or 2+ of protein in the urine.

Mugo et al. (2005:349), differs in the finding of proteinuria in mild pre-eclampsia with proteinuria of ≥300mg/24 hours. If 24 hour urine testing is unavailable, at least two random urine samples of at least 1+ (30mg/dL) protein on urine dipstick, collected 6 hours apart (Cundy et al. 2001:483),as well as Mugo et al. (2005:349).

2.6.4 Other clinical manifestations

Other clinical manifestations reported are headache, visual changes, persistent epigastric pain, intra uterine growth restriction or oligohydramnios (Mugo et al, 2005:349).

Oedema of the face and hands, rapid weight gain and decreasd fetal movement are clinical manifestations for pre-eclampsia (Emery, 2005:348; Sellers, 1997:1165).

High levels of soluble Fms-like tyrosine kinase 1, an anti-angiogenic protein that is associated with low levels of placental growth factor, an angiogenic protein have been shown to be early predictors of subsequent development of pre-eclampsia (Mugo et al, 2005:350).

2.7 ASSESSMENT OF A PREGNANT WOMAN WITH A HYPERTENSIVE DISORDER

2.7.1 Subjective Data: Interview

An adequate medical history taking is essential which includes the review for especially the presence of diabetes mellitus, renal diseases and hypertension.

Family, previous medical and obstetric history, operations, accidents and convulsions are explored for hypertensive disorders, diabetes mellitus and other chronic conditions related to the development of hypertensive disorders.

Social history should include a review of the woman's marital status, nutritional status, cultural beliefs, activity level, and life style behaviours such as smoking, alcohol and drug use. Any complaints of feeling very ill, severe frontal headache, visual disturbances, nausea and vomiting and epigastric pain should be taken note of (Lowdermilk & Perry, 2007:790).

2.7.2 Objective data: Physical examination.

The physical examination will not only include the mother but the fetus as well

2.7.2.1 Physical assessment of the fetus

According to Fraser, Cooper and Nolte (2003:342), fetal assessment is done by the use of the following kick charts, CTG monitoring, serial ultrasound scans, assessment of amniotic volume and fetal breathing movements. These findings are in line with the findings of Cronje and Grobler (2006:506).

a. Monitoring of the Fetus

According to Sellers (1997:1172) the fetal heart should be checked and recorded 4 hourly. Any deviation from the normal which is 100-160 beats per minutes must be reported to the doctors. Fetal movement should be monitored by giving the woman a fetal wellbeing chart to record the kicks of the fetus. The amount of amniotic fluid present can be assessed by ultrasound. If amniotic

fluid is less than normal the fetus is in danger. Auscultation of the fetal heart for the presence of fetal heart beat and for any irregularity is vital.

The fetal heart rate can be assessed intermittently by means of a manual stethoscope or hand held doppler device or it may be assessed continuously using electronic fetal monitoring (EFM). The fetal heart rate should be taken over a complete minute, in order to listen for the beat-to-beat variation. The baseline should be between 110 and 160 beats per minute.

The midwife may use a Pinard stethoscope to listen to the fetal heart rate as the contraction is finishing, detecting any slow recovery of the fetal heart rate back to the baseline. Normally the baseline is maintained during the contraction and immediately after it. If decelerations are heard with a Pinard stethoscope or Doppler instrument in the first stage of labour, then electronic monitoring may be indicated to assess the extent of decelerations (Nolte, 2008:19).

2.7.2.2 Physical Assessment of the Mother

a. Measuring of blood pressure

For a pregnant woman a systolic blood pressure of 120 mmHg and diastolic blood pressure of 80mmHg is regarded as normal blood pressure (Sellers, 1997:1164). Pre-eclampsia is indicated when the blood pressure is raised to 140/90 mmHg or more, taken after 10 minutes of resting. Blood pressure may be taken with the patient sitting, but if raised it must be confirmed with a patient lying down after 2-3 minutes of rest (Huggins, 2001:2) and Tr anqiulli, Giannubilo, Dell'Uomo and Corradetti, 2004:5). (Wallenburg, 2000:1).

Monitoring of blood pressure for an hour is objective and reduces the risk of faulty and diagnostic pitfalls

A study by Benette and Brown (1999:15), state that blood pressure should not be taken after the woman had been experiencing anxiety or pain, had been exercising or smoking, because the readings will be incorrect.

Further more,a study done by Peters and Flack (2003:210), revealed that blood pressure measurements are subjected to a variety of errors arising from the patient, the person taking the measurement and or the environment. To reduce these errors a 24-hour ambulatory monitoring may be used. Ambulatory methods give an average blood pressure reading for 24 hours, as determined by multiple readings taken during the patient's normal home and work routine.

National Maternity Care Guidelines Committee of the Department of Health (2007:78), advise that the midwife must take the diastolic pressure at the point where the sounds disappear (Korotkoff

phase 5), in patients where sounds do not disappear, use the point of muffing (Korotkoff phase 4). This is supported by Lowdermilk and Perry (2007:790).

b. Urine Testing

A normal test result for proteinuria is 10-100mg/24 hours. According to Gibson (2006:20) a 24 hour urine collection for protein excretion in pregnant woman which is up to 300 mg/d and higher are abnormal and may reflect renal involvement during pre-eclampsia. Urine should be checked using a urine dipstick. The urine volume total protein and creatinine should also be measured.

In a study of 12 and 24 urine samples the total protein values correlate well for the diagnosis of pre-eclampsia. In addition in a study of 15 patients for a 24 hour urine specimen, the results show 60% with significant proteinuria. This fin (ding is supported by Wallenburg (2000:1), Bennette and Brown (1999:15), Nolte (1998:278) and Sellers 1997:1169).

According to De Swiet (1998:537), proteinuria is usually the last sign of pre-eclampsia to be manifested and is always serious. Protein may also be found in urine which is contaminated by vaginal discharge due to infection, urinary tract infection and amniotic fluid or blood. Therefore, if a midstream specimen looks crystal – clear but contains protein it is a true proteinuria, and is an indication that the kidneys are damaged and plasma proteins are leaking from the blood into the urine.

c. Assessment of renal function, thrombocytopenia and liver enzymes are essential to diagnose hypertension during pregnancy.

Oedema and Excessive Weight Gain

Sudden, severe, widespread appearance of oedema is suggestive of pre-eclampsia. The oedema pits on pressure and may be found in non-dependent anatomical areas such as the face, hands, lower abdomen, vulva and sacral areas (Fraser, Cooper & Nolte 2003:341 and Cronje and Grobler, 2006:499).

Overweight and weight gain between pregnancies are associated with recurrent hypertensive disorders in pregnancy in a woman with gestational hypertension (Hjartardottir, Leifsson, Geirsson and Steinthorsdottir, 2006:917).

Lowdermilk and Perry (2007:790), suggest that the following information should be obtained:

- dependent oedema should be assessed on the dependent parts of the body where the hydrostatic pressure is the greatest. It can be observed on the feet and ankles in ambulatory patients. In a pregnancy it is observed in the sacral region.

- pitting oedema that leaves a small depression after the finger is applied to the swollen area and disappears within 10-30 seconds.
- deep tendon reflexes should be examined to determine any changes.

2.7.3 Diagnostic tests

2.7.3.1 Laboratory tests

The blood and urine tests as discussed in paragraphs 2.5.2, 2.5.3 and 2.6.2.2 are recommended.

2.7.3.2 Amniocentesis

An amniocentesis can play a vital role in assessing lung maturity in deciding whether to deliver the baby (Emery, 2005:349 and Peters et al., 2003:214).

2.8 MANAGEMENT OF HYPERTENSIVE DISORDERS IN PRIMARY HEALTH CARE

Hypertensive disorders may affect all the systems of the body, which may result in the woman being exposed to many injuries and fears, deficient diversional activity, irritability of the nervous system, and is at risk for excess fluid volume, related to increased sodium and a decreased cardiac output (Lowdermilk & Perry, 2007:795).

2.8.1 Nursing Care

Registered midwives should review the warning signs or symptoms of pre-eclampsia to ensure that an adequate knowledge base exists for decision making, Signs and symptoms such as frontal headache, epigastric pain and blurred vision.

Lowdermilk and Perry(2007:795), suggest the following:

2.8.1.1 Home-Based Care

a. Home environment

The home environment should include the woman's ability to assume self-care responsibility.

b. Self Care

The woman should be taught how to do a self-assessment for clinical signs of pre-eclampsia to provide immediate evidence of a worsening condition.

c. Diet

The diet should be high in protein, a high vitamin intake, low in carbohydrates and no extra salt.

Her intake should include the required amount of protein and vitamins to nourish her growing fetus and to prepare her body for lactation. If the patient has oedema, sodium chloride can be used for cooking.

d. Weight gain

The patient should monitor her weight, by monitoring the swelling of her feet and hands, and puffiness around the eyes. She should also try to lose weight if obese.

e. Monitoring blood pressure

Blood pressure of the patient should be monitored accurately at each weekly clinic visit from 20 weeks of gestation until delivery.

f. Urine testing

Patients should be taught to test their urine for protein.

2 + proteinuria, weight gain and decreased fetal activity should be reported to her health care provider immediately to prevent worsening of a pre-eclampsia condition.

g. Bed rest

Teach the pregnant woman about the use of rest and relaxation as palliative treatment options to decrease blood pressure and promote diuresis. The patient should have adequate bed rest (12 hours at night and a further 3 hours during the day, to ensure an improved blood flow to the heart and to the placenta.

h. Stress management

Stress management and relaxation techniques to help manage tension of confinement should be taught to the pregnant woman.

i. Family support

The midwife should provide a calm, soothing atmosphere and teach the family to provide emotional support to facilitate coping. Encourage verbalization of fears to decrease intensity of emotional response. Promote family participation in the management of her pre-eclamptic condition, to promote a greater sense of control. Assist the woman to be creative and explore personally meaningful activities.

2.8.1.2 Antenatal Care in Primary Health Care

The role of the midwife in the primary health clinic is critical in preventing, identifying and managing hypertension disorders. In the event that pre-eclampsia is diagnosed the patient is immediately referred to an obstetrician (Fraser & Cooper, 2009:403).

The following nursing interventions are suggested and should be adhered to:

a. Patient's History (See also paragraph 2.6.1)

Fraser and Cooper (2009: 402-404), suggest the following specific antenatal interventions:

- the accurate measuring of blood pressure is essential in the management of hypertensive disorders.
- daily blood pressure measurements are required if it is not elevated or where signs of hypertension are absent.

b. Urinalysis

Urine is tested for proteinuria. If the midwife identifies protein in the midstream specimen of urine, a 24 hour urine collection is required, in order to determine the amount of proteinuria.

c. Oedema

A physical examination is done for signs of oedema. Special observations should be made of oedema on the lower extremities of the body. Oedema may first be evident in the feet and ankles.

d. Fetal monitoring

Auscultation of the fetal heart for the presence of the fetal heart beat and for any irregularity which may indicate fetal distress should be done. The fetal movement chart and a biophysical profile to assess the fetal health and well-being should be implemented. The patient is instructed on how to carry out the kick count test.

e. Abdominal examination

The abdomen is observed for clinical signs of reduced amniotic fluid and fetal growth retardation. Any discomfort or tenderness should be recorded and reported to the doctor.

f. Primary health care clinic visits

Sellers (1997:1172), supported by various researchers in obstetrics such as Coleman (2001:17), Emery (2005:348), Peters et al. (2003:213) and Duley (2003:167) recommend that weekly antenatal visits to the primary health care clinic are essential to prevent further deterioration of the

condition. The patient is also informed to visit the clinic or hospital if there is any swelling of the legs or fingers or a decrease in fetal movement.

g. Additional interventions by the primary health care midwife

The midwife assesses the fetal condition. However, in the event where a doctor is available in the clinic or hospital, a fetal non-stress test and ultrasonic scan for signs of intra uterine growth retardation, is prescribed. The patient is usually admitted to the hospital at about 37 weeks gestation, if the condition is stable.

Intravenous fluids may be given in the clinic as prescribed but, care should be taken that the patient is not over-hydrated, especially where there is reduced fluid output. Furthermore, the midwife must check for any signs of labour. Facilities should be available in the clinic to manage an eclamptic fit (Sellers, 1997:1171-1173). These interventions are supported by the National Maternity Care Guidelines Committee of the Department of Health (2007:81-83), Peters et al. (2003:214)and Mugo et al. (2005:352).

h. Medical treatment in the prevention of hypertensive disorders

The midwife should ensure that calcium supplements are prescribed to reduce the risk of hypertensive disorders. A diet rich in protein, fibre and vitamins are recommended. The use of antioxidants, vitamin C and E supplements are also recommended to reduce the risk of pre-eclampsia. These supplements do not prevent pre-eclampsia in the women at risk for a hypertensive disorder, but will have an adverse effect on the baby by increasing the rate of babies of low birth weight. (Fraser & Cooper 2009, 403-405).

It has been shown in a study of 100 high risk women, treated with aspirin that preterm deliveries are prevented by improving the blood to the kidneys, brain and uterus (Fraser & Cooper 2009:404).

i. Medical treatment for hypertensive disorders

The use of anti-hypertensive therapy as prophylaxis shows no benefit in significantly prolonging pregnancy or improving maternal or fetal outcome. Its use is however advocated as short term therapy in order to prevent an increase in blood pressure and the development of severe hypertension; thereby reducing the risk of cerebral haemorrhage (Fraser & Cooper, 2009:404).

Methyldopa (Aldomet), is the most widely used anti-hypertensive medication in women with mild to moderate gestational hypertension and appears to be safe and effective for both mother and fetus. Nifedipine (Adalat), is being used increasingly to treat severe hypertension in pregnancy although its safety and efficacy are still to be evaluated. It improves cardiac output when peripheral

resistance is reduced. It has also been found that the use of anti-coagulants or anti-platelet agents have been considered for the prevention of fetal growth restriction and pre-eclampsia. Aspirin is commonly used to inhibit the production of the platelet-aggregating agent, thromboxane A2 (Lowdermilk & Perry, 2007:1146).

Emery (2005:348), states that magnesium sulfate is still the drug of choice for preventing and arresting eclamptic seizures.

Diazepam (valium), is given to promote patient sleep and to lower the diastolic blood pressure to below 100 mmHg; it is also recommended that hydralazine is used to lower the blood pressure. Continuous monitoring of the blood pressure is required to determine whether the treatment is effective. If the patient does not respond to the treatment the primary health care midwife should refer the patient to the hospital for further management (Sellers, 1997:1182).

2.9 COMPLICATIONS OF HYPERTENSIVE DISORDERS

2.9.1 Fetal growth restriction

Intra uterine growth restriction is defined as a birth weight of less than the 5th percentile, as currently guided by the National Maternity Care Guidelines Committee of the Department of Health (2007:91). Intra uterine growth restriction (IUGR), is reflected by small for gestational age. The status is considered a measure of severity of hypertensive disorders of pregnancy due to utero-placental insufficiency before 20 weeks of gestation

According to the study of Grisaru-Granovsky, Halevy, Eidelman, Elstein and Samueloff (2007; 335), it was identified in a study of 30 woman, that 16% presented with intrauterine growth restriction during pregnancy, preceding the diagnosis of hypertensive disorders of pregnancy.

The National Maternity Care Guidelines Committee of the Department of Health(2007:91), state that intra uterine growth restriction is associated with placental insufficiency which may result from pre-eclampsia. A physical examination shows the following clinical manifestations:

- On palpation the fetal head is hard with a small body
- The head engages before 37 weeks
- Reduced amniotic volume
- Irritable uterus before 37 weeks
- A measurement less than the 10th centile for gestational age
- Failure of the symphysis fundal height to increase.

These serial measurements should raise suspension of IUGR in the mother with hypertensive disorders.

Thelma and James (1999:17), mentioned that there is an expected fetal response of lowered weight gain in women with hypertensive disorders. Their findings shows that 30% of infants for pre-eclamptic women are growth restricted.

2.9.2 Complications of the mother

2.9.2.1 Abruptio Placenta

After the 22nd week of pregnancy premature separation of a normal positioned placenta occurs. The cause is often associated with severe pre-eclampsia due to placental dysfunction. Partial separation of the placenta causes bleeding from the maternal venous sinuses in the placental bed. Further bleeding continues to separate the placenta to a greater or lesser degree. There is no vaginal bleeding, but the mother will have all the signs and symptoms of hypovolaemic shock, caused by concealed bleeding into the muscle of the uterus (Sellers, 2006:1196).

The fetus is directly affected by the abruptio placenta and fetal monitoring with the use of a cardiotocograph will provide complete information about the fetal condition. The midwife should be vigilant in how information about the fetus is conveyed to the mother. If the fetal heart is absent on the first examination, she should explain to the mother that a fetal monitor is needed to establish the condition of the baby. The woman should be transferred to a consultant obstetric unit. The midwife may site an intravenous cannula prior to transfer (Nolte, 1998:283-285).

2.9.2.2 Acute Renal Failure

Pre-eclampsia causes a reduced blood supply to the kidneys, resulting in oliguria.i.e. a urinary output < 400mls in 24 hours. The tubules and glomeruli have become ischaemic and if prolonged degenerative changes in the epithelium of the tubules occurs (Sellers, 1997:1632-1633). Consequently, it will result in renal cortical necrosis of the tubules that may result in acute renal failure that warrants a referral to the dialysis unit (Smeltzer & Bare, 2000:1148-9).

a. Clinical manifestations will include :

- dry mucous membrane
- breath may have an odour of urine “urinic fetor”
- headache
- persistent vomiting
- diarrhoea
- tachycardia

- affected central nervous system will result in drowsiness, headaches and seizures
- laboratory tests may show increase in serum urea, creatinine and nitrogen.

.

Interventions include accurate fluid intake and output and a diet low in protein. Reduce fluids to 500-1000ml daily (Sellers, 1997:1632-1633 and Nolte, 1998:348).

2.9.2.3 HELLP Syndrome (Haemolysis, elevated liver enzymes and low platelet count)

The HELLP syndrome is thought to be a multiple systemic component of the syndrome of a severe pre-eclampsia due to endothelial injury.

a. Clinical manifestations may include*:*

- flu-like symptoms
- right upper quadrant pain
- nausea
- vomiting
- mucosal bleeding
- petechial haemorrhages
- presence of micro-angiopathic haemolytic anaemia
- elevated lactate dehydrogenase levels
- significant drop in haemoglobin.

According to Emery (2005:347), these clinical manifestations may be suggestive of HELLP syndrome, substantiated by Mugo et al. (2005:352), Sellers (1997:1167), Nolte (1998:291) and Fraser et al. (2003:365).

Emergency care will be determined by the severity of the maternal condition and the maturity and well being of the fetus. Pregnancy will be terminated or the woman will be relieved by the delivery of the baby at 34 weeks gestation when the lungs are fully matured or when the fetus is at danger during an eclamptic period of the mother (Nolte, 1998:293 and Leerners, Rath, Kuse and Neumaier-Wagener,2005:556).

2.10 CONCLUSION

This chapter described an intensive literature review about hypertensive disorders in pregnancy. The following aspects were addressed: the types of hypertensive disorders, factors contributing to

hypertensive disorders, pathophysiology, clinical manifestations, assessment, diagnosis and the management of hypertensive disorders and complications.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The impetus of this chapter is to describe the research methodology that was applied to determine the knowledge of registered midwives managing hypertensive disorders in pregnancy at primary health care Level in the Buffalo City Local Service Area of the Eastern Cape Province.

3.2 GOAL

According to Burns and Grove(2007:99),a research purpose is a clear concise statement of the specific aim or goal of the study.

The purpose of this study was to investigate scientifically the knowledge of the registered midwives managing hypertensive disorders in pregnancy working in the Primary Health Care Services in the Buffalo City Local Service Area of the Eastern Cape Province.

3.3 OBJECTIVES

The objectives for this study were to determine whether the registered midwives working in primary health care facilities have adequate knowledge about::

- hypertensive disorders in pregnancy
- the assessment of hypertensive disorders in pregnancy
- the diagnosis of hypertensive disorders in pregnancy
- the management of hypertensive disorders in pregnancy.

3.4 RESEARCH METHODOLOGY

3.4.1 Research design

An explorative, correlation, non-experimental research design was applied with a quantitative approach, to investigate scientifically the knowledge of the registered midwives about hypertensive disorders in pregnancy working at primary health care level in the Eastern Cape Province.

According to De Vos, Strydom, Fouche and Delport (2002:143), the aim of exploratory research is to explore a relatively unknown research area. The purpose is to gain a new insight into the

phenomena under study, rather than collecting accurate and replicable data. During this study the researcher explored the literature and the natural setting of registered midwives and their experiences with the management of hypertension at primaryealth care level. This was done to extend the theoretical knowledge base about the registered midwives and their practices.

3.4.2 Research question

A research question is a concise interrogative statement, developed to direct studies that are focused on the description of variables or the examination of relationships between variables and the prediction of dependent variables, using independent variables (Burns &Grove, 2007:720). The research question which guided this study was: “Do the registered midwives working at primary health care level have adequate knowledge about the management of hypertensive disorders in pregnancy?”

3.4.3 Population and sampling

According to LoBiondo-Wood and Haber (2006:569), a population is a well defined set that has certain specified properties. It is furthermore described as a collection of objects, events or individuals having some common characteristics that the researcher is interested in studying (Mouton, 1996:134). The population target group for this study was the registered midwives working in the primary health care Clinics in the Buffalo City Local Service Area of the Eastern Cape The total population of registered midwives working in this particular area was 228.

Sampling is a process in which representative units of a population are selected for study in a research investigation (LoBionda-Wood and Haber: 2006:572).

As shown in table 3.1 Region C in the Eastern Cape consists of 98 clinics which include rural and urban clinics in the Buffalo City Local Service Area. A random sample of 43 (44%) clinics was drawn from the total number of 98 clinics. The researcher used 28 (42%) clinics from the rural area and 15 (47%) clinics from the urban area. A stratified random sample was applied to draw the list of all clinics and select every second clinic on the list. The target population for this study was the registered midwives allocated in these clinics. In the rural clinics 2 registered midwives (RM) were allocated and in urban clinics 3 registered midwives were allocated per clinic. The total population of the registered midwives working in the Buffalo City Local Service Area was 228. A stratified random sample was applied to select the sample of registered midwives, 101 (44%) of the total population of 228 as planned and shown in tables 1.2 and 1.3. Guided by the statistician a sample of at least 100 registered midwives were required, because it improves the validity of the study..

3.4.4 Criteria

The criteria used in a study refer to those characteristics that a subject or elements should possess to be part of the target population (Burns & Grove, 2007:345).

3.4.4.1 Inclusion criteria

The following subject selection criteria were set for the purpose of this study:

- all registered midwives working in the clinics of Buffalo City Local Service Area
- all midwives permanently employed at one of the participating clinics.

3.4.4.2 Exclusion Criteria

This study excluded all other nursing categories namely:

- enrolled nurses
- enrolled nursing assistance.

3.4.5 Pilot Study

A pilot study attempts to test the instrument for ambiguity and accuracy and is a trial run done in preparation for a major study (Polit & Hungler, 2001:467). According to LoBiando-Wood and Haber (2006:569), it is a smaller version of the actual study conducted as a prelude to a larger scale study, but is often called the “parent study”.

A pilot study was conducted in four primary health care clinics in April 2009 to determine the feasibility of the actual study. A stratified sample of 11 (10%), was randomly selected based on the actual number of participants which formed the sample of the study. These participants did not form part of the actual study. The results of the pilot study showed that there was some ambiguity in the questions and these were addressed. The participants of the pilot study were excluded from the actual study.

3.4.6 Reliability and Validity

Reliability of a study represents the consistency of the measure obtained while validity is the measure of the truth or accuracy of a claim. This is an important aspect throughout the research process. Burns and Grove (2009:718, 727, 2007:552 and 559) also describe validity as an extent to which an instrument accurately reflects the abstract concept being examined. Supported further, validity is the extent to which an instrument measures what it is supposed to measure (Polit & Hungler, 2001:473).

For the purpose of this study content validity was assured through an extensive literature review, representatives of the relevant population and content experts. Experts were consulted to assist with the appropriateness of the individual questions in the questionnaire, thus helping to establish content validity for the instrument. A statistician was consulted with the design of the questionnaire and to assist with the planning of the data analysis and was also consulted throughout the study. At least 6 experts in midwifery and a research methodologist were consulted to evaluate the content validity of the instrument. The reliability and validity of the study was further assured by testing the instrument during a pilot study. All ambiguity and inaccuracies were addressed as identified in the pilot study, specifically related to the section on the management and prevention of hypertensive disorders. Furthermore, the researcher collected all data personally.

3.4.7 Instrumentation

According to Burns and Grove (2009:704), instruments are measuring tools which adhere to specific rules when being developed. LoBiondo-Wood and Haber (2006:565), refers to instrumentation as "…changes in the measurement of the variables that may account for changes in the obtained measurement…"

The instrument developed for the purpose of this study was a structured questionnaire consisting of only closed questions. The design of the questionnaire was based on an extensive literature research and the researcher's clinical experience.

The questionnaire was validated by at least 6 experts in midwifery including a research methodologist and statistician.

A self administered questionnaire was developed for registered midwives. It was divided into 4 sections namely biographical, knowledge concerning questions on diagnosis, assessment and management of hypertensive disorders. The instrument was intended to elicit information through written responses from the participants (Annexure A).

3.4.7.1 Layout of questionnaire:

Section A: Biographical data

Questions 1- 5 were based on the age, gender, basic qualifications and years of clinic experience. Questions 6-10 were based on the visit of the doctors to the clinic, average number of clients managed per day and the number of registered midwives working in the clinic.

All these questions provided information about the strength of registered midwives working in the clinics.

Section B: Knowledge and diagnosis of hypertensive disorders in pregnancy.

Questions 11-19 were based on hypertensive disorders, associated risk factors and the effect of on the mother and the fetus. Questions 11, 12, 13, 15, 16, were based on the diagnosis of a hypertensive disorder.

Section C: Assessment of hypertensive disorders in a pregnant women.

Questions 20-37 were based on the assessment of the medical and social history, physical examination, clinical manifestations and diagnostic tests.

Section D: Management of hypertensive disorders in pregnancy.

Questions 38-45 were based on the management of hypertensive disorders: including prevention and treatment.

3.4.8 Data Collection

According to Burns and Grove (2007:536), data collection is the systematic gathering of information relevant to the research papers or specific objectives, questions or hypothesis. The researcher obtained consent from the participants and maintained confidentiality with all the information.

For the purpose of this study the researcher collected all data personally by handing out a structured questionnaire to individual participants and collecting it in a sealed envelope after completion.

Data collection was done over a period of 4 weeks during May 2009.2. A 100% return rate was achieved. The questionnaire was completed within 30 minutes.

3.4.9 Data analysis and interpretation

The data was analysed and interpreted by the researcher with the help of a statistician and a computer program, the STATISTICA (Version 8). The data was tabulated and presented in graphs, tables and frequencies. Statistical associations were determined between various variables using various statistical tests to test for associations between variables. Further discussion is to be found in chapter 4.

3.5 LIMITATION OF THE STUDY

The study was executed as planned with no limitations.

3.6 ETHICAL CONSIDERATION

The researcher obtained consent to conduct research from the committee for Human Science Research of the Faculty of Health Sciences, Stellenbosch University, as well as the Head of Department of Health in the Eastern Cape Province(Annexure C) where the research was conducted (Annexure B). Informed written consent was obtained from the participants (Annexure D). Confidentiality and privacy concerning all information were ensured. To ensure anonymity each participant was provided with a questionnaire and an envelope. Participants were advised to place the questionnaire into the envelope provided after completion. Sealed envelopes were handed directly to the researcher. The individual data has been stored and is only accessible to the researcher. It will be kept for a period of five years, thereafter it will be destroyed.

3.7 CONCLUSION

In chapter 3, the researcher described the research methodology related to the project. The different steps of the methodology and limitations concerned with the project were described. The procedures involving data analysis and interpretation are discussed in chapter 4.

CHAPTER 4: ANALYSIS AND INTERPRETATION OF RESEARCH FINDINGS

4.1 INTRODUCTION

In this chapter, the findings of the research study titled “Evaluation of the knowledge of the registered midwives working in primary health care in the Eastern Cape” will be presented and interpreted. A quantitative approach was applied.

4 .2 DESCRIPTION OF STATISTICAL ANALYSIS

The data are presented in the form of frequency distribution tables, a graphical presentation and frequencies. The chi-squared, Mann Whitney, Kruskal Wallis and Spearman statistical correlation tests were used to test for associations between demographic variables and the responses to the questions about the knowledge of the nurses working in clinics on hypertensive disorders.

The p – value is the measure reported from all tests of statistical significance. It is defined as the probability that an effect, at least as extreme as that observed in a particular study, could have occurred by chance alone if the p – value is greater than 0.05 by convention, the chance cannot be excluded as a likely explanation and the findings are stated as not statistically significant at that level (Burns & Grove, 2007:328-331). Therefore the 95% confidence interval was applied to determine whether there was an association between variables.

In addition the results are presented in mean scores based on the knowledge of the participants with reference to the questionnaire in totality and to the specific sections.

4.3 SECTION A: BIOGRAPHICAL DATA

4.3.1 Variables 1-5: Age group

Table 4.1 shows that n= 67(66.3%), of the participants were older than 40 years of age while n=34 (33.7%), were younger than 40 years of age.

Table 4.1: Age group

Variables	Age	n (%)
1	21yrs-30yrs	10 (9.9%)
2	>30Yrs-40yrs	24 (23.8%)
3	>40yrs-50yrs	33 (32.7%)
4	>50yrs	27 (26.7%)
5	>60yrs	7 (6.9%)
	TOTAL	**101 (100%)**

4.3.2 Variables 6-7: Gender

Table 4.2 shows that n=88 (87.1%), of the participants were females. This distribution shows the dominance of females in the profession which is substantiated by Kelly (2006:27), who has acknowledged the female dominance in the nursing profession. A further analysis shows that there is no statistical significance between gender and knowledge according to the Man-Whitney statistical test (p=0.41). However, the males obtained a higher mean score (0.683), on the knowledge of hypertensive disorders than the females (0.663). The total mean score of all the participants were 0.666.

Table 4.2: Gender n=101

Variables	Gender	n (%)=101
6	Male	13 (12.9%)
7	Female	88 (87.1%)
	TOTAL	**101 (100%)**

4.3.3 Variables 8-12: Qualifications in midwifery

Table 4.3 shows that the majority of participants in=53 (52.4%), indicated that they had a one year diploma in midwifery, followed by those with the 4 year diploma in General Nursing (Psychiatry & Community Health) and Midwifery n=33 (33.7%). Only one participant held an advanced diploma qualification in midwifery. A further analysis shows that there is no statistical significant association between qualifications (4 year diploma in nursing, degree in nursing and one year basic diploma in midwifery) and their knowledge about hypertensive disorders. However, the mean scores of the knowledge about hypertensive disorders obtained between the three qualifications shows that the 1 year basic diploma in midwifery obtained the highest score as shown in figure 4.1.

Table 4.3: Qualifications in midwifery (n=101)

Variables	Qualifications	n (%)
8	4yrs Diploma in General Nursing	33 (32.7%)
9	4yrs Degree in General Nursing	14 (13.9%)
10	1yr Diploma in Midwifery	53 (52.4%)
11	Advanced Diploma in Midwifery	1 (1.0%)
12	Other	0 (0%)
	TOTAL	101 (100%)

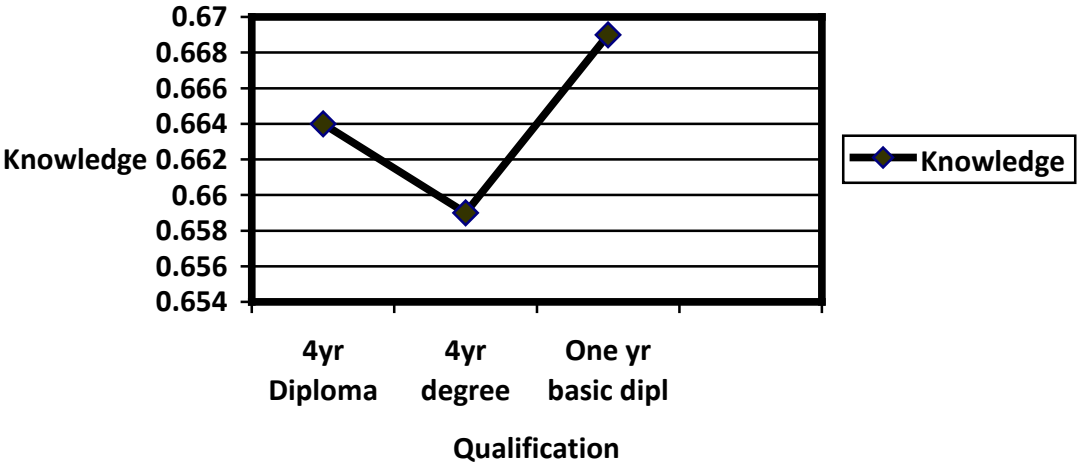

Figure 1: Qualifications and mean scores of three qualifications

4.3.4 Variables 13-17: Period of experience as midwife

Table 4.4 shows that the majority of participants, n=41 (40.6%), have more than 10 years of experience in midwifery, followed by those with more than 6 months but up to 3 years, with n=22 (21.8%).The least number of participants, n=5 (5%) had experience in midwifery ranging from 0 to 6 months. Experienced midwives are therefore working in the clinics that formed part of this study.

Table 4.4: Period of experience as a midwife (n= 101)

Variable	Experience	n (%)
13	6 months or less	5 (5%)
14	>6 months-3yrs	22 (21.8%)
15	>3yrs-5yrs	15 (14.8%)
16	>5yrs-10yrs	18 (17.8%)
17	>10yrs	41 (40.6%)
	TOTAL	101 (100%)

4.3.5 Variables 18-22: Experience as a midwife at the present clinic

Table 4.5 indicates that the majority of the participants have more than 5yrs experience in midwifery, n=59 (58.4%), followed by participants with experience between 3yrs-5yrs, n=15 (4.8%). Only 5 (5%), have less than 6 months of experience. The clinics are well resourced in terms of experience in midwifery, which is an advantage to the clinical environment.

Table 4.5: Period of experience as a midwife (n = 101)

Variables	Experience	n (%)
18	6 months or less	5 (5%)
19	>6 months-3yrs	22 (21.8%)
20	>3yrs-5yrs	15 (4.8%)
21	>5yrs-10yrs	18 (17.8%)
22	>10yrs	41 (40.6%)
	TOTAL	101 (100%)

4.3.6 Variables 23-24: Do doctors regularly visit the clinic?

Table 4.6 shows that n= 73 (72.3%), of the participants indicated that the doctors regularly visited their clinics for consultation with patients. Despite the fact that

28(27.7%), indicated that they do not receive any visits from doctors, this is in line with the Primary Health Care Policy as described in the 2010 Service Plan of the Western Cape, that indicates that the primary health care nurse practitioner or advanced trained midwife will manage PHC clinics. However, only 1 (1%), of these participants held a Diploma in Advanced Midwifery, as shown in table 4.3. Problems may result in the clinical environment as a result of this deficit as sudden emergency high risk complicated deliveries such as forceps delivery may only be managed by advanced trained midwives

Table 4.6: Do doctors regularly visit the clinic? (n=101)

Variables	Regular doctor's visits to the clinics	n (%)
23	No	28 (27.7%)
24	Yes	73 (72.3%)
	TOTAL	101 (100%)

A Man-Whitney statistical test shows a significant statistical association between the knowledge of staff in clinics where doctors are visiting regularly and where there are no visits (p=0.04). In clinics where there are no doctors' visits the knowledge of the staff is higher (0.691), than the total

knowledge mean score (0.666). Where doctors are regularly visiting the clinics the mean knowledge score is lower (0.656), than the total knowledge mean.

4.3.7 Variables 25-28: If "Yes" How often?

Table 4.7 proves that n=73 (72%), participants indicated that doctors do visit their various clinics. However, n=33 (45.2%), of them stated that the doctors pay a visit once a week, with n=28 (38.3%), indicating that doctors usually visit once a month.

Table 4.7: If "yes", how often does the doctor visit the clinic? (n = 73)

Variable	If "yes", how often do doctors visit the clinic?	n (%)
25	Daily	11 (15.1%)
26	Once a week	33 (45.2%)
27	Once a month	28 (38.3%)
28	Other	1 (1.4%)
	Total	73 (100%)

4.3.8 Variables 29-32: If "No" Why?

Table 4.8 shows that n=16 (57.1%), of those participants who indicated that there were no doctors' visits indicated a shortage of doctors as a reason, while n= 7 (25%), indicated that the midwives were competent to do the job, n= 5(18%). Among the participants, n=5 (100%), who had other reasons, n=3 (60%), of them said their patients were always referred to hospital, n=1(20%), claimed that their organogram did not include doctors and the last one n=1(20%), said that there was no allocation for doctors.

Table 4.8: If "no", reasons for no visits (n=28)

Variables	If no, reasons for no doctor's visits.	n (%)
29	Clinic inaccessible	0 (0%)
30	Midwives competent	7 (25.0%)
31	Shortage of doctors	16 (57.1%)
32	Other	5 (17.9%)
	Total	28 (100%)

However, it was identified that the participants who indicated that they are competent has a lower knowledge mean (0.669), than those who indicated there is a shortage of doctors (0.683).

4.3.9 Variables 33-37: Average number of clients

Table 4.9 shows the number of clients attending the clinic per day. Most of the participants, n=43 (42.6%), reported that ≤15 patients attend the antenatal clinic per day, followed by n=30 (29.7%), who indicated >20 ≤50 patients. Only n=7(6.9%), of the participants said there were more than 60 clients attending the antenatal clinic per day.

Table 4.9: Average number of clients attending the antenatal clinic per day (n = 101)

Variables	Average number of clients attending clinic	n (%)
33	≤15 per day	43 (42.6%)
34	>15≤20	12 (11.9%)
35	>20≤50	30 (29.7%)
36	>50≤60	9 (8.9%)
37	>60	7 (6.9%)
	Total	101(100%)

4.3.10 Variables 38-42: Registered midwives currently working in the clinic

Table 4.10 shows the number of registered midwives currently working in the clinic. A total of n=59 (58.4%) participants indicated that there were 5 midwives working in their clinics while n= 20 (19.8%) of them said there were three midwives working in their clinics.

Table 4.10: Registered midwives currently working in the clinic (n= 101)

Variables	Number of registered midwives working in the clinic	n (%)
38	1	1 (1%)
39	2	9 (8.9%)
40	3	20 (19.8%)
41	4	12 (11.9%)
42	5	59 (58.4%)
	Total	101 (100%)

4.4 SECTION B: KNOWLEDGE OF HYPERTENSIVE DISORDERS IN PREGNANCY

This section consists of questions 11 – 19. Each question has 2 – 3 options from which participants could choose the appropriate response.

4.4.1 Variables 43-45: Definition of hypertension in pregnancy

Table 4.11 shows that most of the participants, n=67 (66.3%), defined hypertension in pregnancy correctly as occurring when a systolic blood pressure is greater than or equal to 140 mmHg or diastolic blood pressure is less than or equal to 90 mmHg or mean arterial pressure is greater than or equal to 105 mmHg (43). The correct definition is supported by Peters and Flack (2003:209); Dafallah, El-Agib and Bushra (2003:369) and Roberts,eta el (2005:333).

Table 4.11: Definition of hypertension in pregnancy

Variables	Knowledge about the definition of hypertensive disorders	n (%)
43	Systolic blood pressure≥ 140mmhg or diastolic blood pressure ≤ 90mmHg or mean arterial pressure ≥ 105mmHg	67 (66.3%)
44	Systolic blood pressure≥ 120mmHg or diastolic blood pressure ≥ 100mmHg or mean arterial pressure ≥ 100mmHg	13 (12.9%)
45	Systolic blood pressure≥ 130mmHg or diastolic blood pressure ≥ 100mmHg or arterial pressure ≥ 105mmHg	21 (20.8%)
	Total	101 (100%)

However it is problematic that 34 (33.7%), have indicated the incorrect answer that may result in a misdiagnosis. A misdiagnosis may contribute to the increase in the morbidity and mortality rate (See paragraph 1.2).

4.4.2 Variables 46-48: Definition of gestational hypertension

Table 4.12 shows that n=57 (56.4%), of the participants defined gestation hypertension correctly as the onset of hypertension without proteinuria, after 20 weeks of pregnancy. Leeners, Neumaier-Wager, Kuse, Irawan, Imthurn, and Rath, (2005:442); Lowdermilk and Perry (2007:787), support this definition. It is problematic that 44 (43.6%), of participants were unable to define gestational hypertension.

Table 4.12: Definition of gestation hypertension

Variables	Definition of gestation hypertension	n (%)
46	Onset of hypertension without proteinuria, after 20 weeks of pregnancy	57 (56.4%)
47	Onset of hypertension 2+ + of proteinuria within 20 weeks pregnancy	35 (34.7%)
48	Onset of hypertension 2+ + of protein after 35 weeks of pregnancy	9 (8.9%)
	Total	101 (100%)

4.4.3 Variables 49-51: Definition of chronic hypertension

Table 4.13 shows that most of the participants n=71 (70.3%), defined chronic hypertension in pregnancy correctly as hypertension present before pregnancy or diagnosed before 20 weeks of gestation.

Table 4.13: Definition of chronic hypertension

Variables	Definition of gestation hypertension	n (%)
49	Hypertension develops after 20 weeks of gestation and is characterized by hypertension and proteinuria.	18 (17.8%)
50	Hypertension presents before the pregnancy or diagnosed before 20 weeks of gestation.	71 (70.3%
51	or diastolic blood pressure ≥ 110 mmHg and proteinuria > 29/24 hr urine specimen ≥ of 2+ on dipstick.	12 (11.9%
	Total	101 (100%)

Leeners, Neumaier-Wager, Kuse, Irawan, Imthurn, and Rath (2005:442), Lowdermilk and Perry (2007:787), support this definition. It is a concern that 30 (29.7%), of the participants do not know the definition.

4.4.4 Variables 52-54: Definition of proteinuria

Table 4.14 shows that most of the participants, n=61 (60.4%%), correctly defined proteinuria as urine concentration of greater than or equal to 30 mg/dl more in at least two random urine specimen collected at least 6 hours apart with no evidence of urinary tract infection.

Table 4.14: Definition of proteinuria

Variables	Definition of chronic hypertension	n (%)
52	Urine concentration of ≤ 30mg/dl or more in at least 3 hours apart with no evidence of infection.	27 (26.7%)
53	Urine concentration of ≤ 40mg/dl or more in at least 4 hours apart with evidence of urinary tract infection.	13 (12.9%)
54	Urine concentration of ≥ 30mg/dl in at least two random urine specimens collected at least 6 hours apart with no evidence of urinary tract infection.	61 (60.4%)
	Total	101 (100%)

It is problematic that 40 (39.6%), of the participants were unable to define proteinuria. The correct answer is supported by Wolf, et al (2004:1330-1338).

4.4.5 Variables 55- 57: Definition of eclampsia

Table 4.15 shows that the majority of the participants, n=98 (97%), defined eclampsia correctly as the onset of seizure activity in the woman diagnosed with pre-eclampsia. This definition is supported by Peters and Flack (2003:209), Sellers (1997:1162), Zhang, Meikle and Trumble (2003:211).

Table 4.15: Definition of eclampsia

Variables	Definition of eclampsia	n (%)
55	Hypertension present before pregnancy	1 (1.0%)
56	Onset of seizure activity in the woman diagnosed with pre-eclampsia	98 (97.0%)
57	Onset of hypertension, without proteinuria after 20 weeks of pregnancy	2 (2.0%)
	Total	101 (100%)

4.4.6 Variables 58-60: Understanding pre-eclampsia

Table 4.16 shows that the majority of participants n=73 (72.3%), indicated correctly that pre-eclampsia is hypertension that develops after 20 weeks of gestation and is characterized by the presence of hypertension and proteinuria.

It is problematic that 28 (27.7%), of participants incorrectly answered this question. The definition is supported by Emery (2005:346), Coleman (2001:17), Molvarec et al. (2006:780) and Florio et al. (2006:1831), who defined pre-eclampsia as a hypertension that develops after 20 weeks of gestation and is characterized by the presence of hypertension and proteinuria.

Table 4.16: Understanding pre-eclampsia

Variables	Understanding pre-eclampsia	n (%)
58	Hypertension develops after 20 weeks of gestation and is characterised by hypertension and proteinuria	73 (72.3%)
59	Hypertension develops after 28 wks of gestation	4 (4.0%)
60	Hypertension develops within 28 wks of gestation and the presence of proteinuria and hypertension	24 (23.7%)
	Total	101 (100%)

4.4.7 Variables 61- 63: Major factors associated with development of pre-eclampsia

Table 4.17 shows that n=57 (56.4%), of the participants indicated correctly that the major risk factor associated with the development of pre-eclampsia is obesity. It is problematic that 44 (43.6%), is unable to identify the risk factors associated with the development of pre-

eclampsia. Andreasen, Andersen and Schantz (2004:1023), substantiate that the major factor associated with the development of pre-eclampsia is obesity.

Table 4.17: Major risk factor associated with development of pre-eclampsia

Variables	Major risk associated with development of pre-eclampsia	n (%)
61	Pneumonia	0 (0.0%)
62	Cardiac disease	44 (43.6%)
63	Obesity	57 (56. 4%)
	Total	101 (100%)

4.4.8 Variables 64-66: Maternal effects of pre-eclampsia

Table 4.18 shows that n=64 (63.4%), of the participants correctly indicated that the maternal effects of pre-eclampsia include intra-uterine growth retardation and convulsions. However, 37(36.6%), of the participants were not able to identify the correct answer.

The maternal effects of pre-eclampsia are supported by Emery (2005:346), who substantiates that the maternal effects of pre-eclampsia was caused by the intra uterine growth retardation and convulsions.

Table 4.18: Maternal effects of pre-eclampsia

Variables	Maternal effects of pre-eclampsia	n (%)
64	Intra-uterine growth retardation and convulsions	64 (63.4%)
65	Epigastric pain and visual problems	35 (34.6%)
66	Aggressiveness and irritability	2 (2.0%)
	Total	101 (100%)

4.4.9 Variables 67-69: Fetal effects of eclampsia

Table 4.19 shows that a total of n= 90 (89.1%), participants indicated correctly that the fetal effects of pre-eclampsia include reduced placental perfusion. Gibson (2006:15) and Sellers (2005:1185), substantiate that the fetal effects of pre-eclampsia include reduced placental perfusion.

Table 4.19: Fetal effects of pre-eclampsia

Variables	Fetal effects of pre-eclampsia	n (%)
67	Urinary output decrease	9 (8.9%)
68	Epigastric pain	2 (2.0%)
69	Reduced placental perfusion	90 (89.1%)
	Total	101 (100%)

In conclusion to this section with reference to the knowledge about hypertensive disorders, the females had a higher knowledge mean score (0.551) than the males (0.504). In addition the knowledge means score of the basic one year diploma was the highest (0.555) followed by the 4 year diploma (0.538) and the lowest 4-year degree (0.507). The knowledge means score of the participants where there are no doctors' visits (0.587) are better than those who have doctors' visits (0.529). Participants who indicated that they do not have any doctors because they are competent had a lower score (0.507) than those who indicated the reason for not having a doctor is because there is a shortage of doctors (0.604). A statistical significant association was identified between the period of experience and the knowledge about hypertensive disorders using the Spearman statistical test (p=<0.01).

4.5 SECTION C: ASSESSMENT AND DIAGNOSIS OF HYPERTENSIVE DISORDERS IN PREGNANT WOMEN

This section consists of questions 20 – 37. Each question has 2 – 3 options from which the registered midwives are to choose the appropriate response.

4.5.1 Variables 70-72: Subjective data pertaining to medical history

Table 4.20 shows that the majority n=79 (78.2%), indicated correctly that renal diseases and diabetes mellitus are subjective data that must be collected pertaining to medical history. However, n=22 (21.8%), were not able to give the correct answer.

Table 4.20: Subjective data pertaining to medical history

Variables	Subjective data pertaining to medical history	n (%)
70	Fetal movements	20 (19.8%)
71	Cultural believes	2 (2.0%)
72	Renal diseases, diabetes mellitus	79 (78.2%)
	Total	101 (100%)

Thelma and James (1999:17) and Myers and Baker (2002:119), verify that renal disease and diabetes mellitus are subjective data that must be collected pertaining to medical history.

4.5.2 Variables 73-75: Social history of pregnant women

Table 4.21 shows that the majority of participants, n=73 (72.3%), indicated correctly that the social history included drug abuse, alcohol and smoking. It is a concern that n=28 (27.7%), of the participants were not able to answer this question correctly.

Patient United Kingdom (2006: 6) and Fraser, Cooper and Nolte (2003:241), substantiate that when questioning patients about their social history the registered midwives should ask about drug abuse, alcohol and smoking.

Table 4.21: Social history of a pregnant woman

Variables	Social history of a pregnant woman	n (%)
73	Smoking, renal disease and chronic hypertension	28 (27.7%)
74	Diabetes, pregnancies after donor insemination	0 (0%)
75	Drug abuse, alcohol and smoking	73 (72.3%)
	Total	101 (100%)

4.5.3 Variables 76-78: Clinical manifestations of pre-eclampsia

Table 4.22 shows that n=96 (95%), of the participants indicated correctly that the presence of oedema and protein in urine are clinical manifestations of severe pre-eclampsia. This is supported by Sellers (2005:1164-1165) as well as Fraser, Cooper and Nolte (2003:381).

Table 4.22: Clinical manifestation of pre-eclampsia

Variables	Clinical manifestation of pre-eclampsia	n (%)
76	Weight loss, abnormal blood pressure ≥ 160mmHg of systolic blood pressure	3 (3%)
77	Blood pressure changes from baseline, abnormal weight gain	2 (2 %%)
78	Presence of oedema and protein in urine	96 (95%)
	Total	101 (100%)

4.5.4 Variables 79-81: Clinical manifestations of severe pre-eclampsia

Table 4.23 shows that n=57 (56.4%), of the participants correctly indicated that epigastric pain and headache as the clinical manifestations of severe pre-eclampsia. It is problematic that n= 44 (43.6%), of the participants failed to identify the correct answer. Emery (2005:348), verifies that epigastric pain and headache are the clinical manifestations of severe pre-eclampsia.

Table 4.23: Clinical manifestation of severe pre-eclampsia

Variables	Clinical manifestation of severe pre-eclampsia	n (%)
79	Palpitations and tiredness	17 (16.8%)
80	Headache, backache and sweating	27 (26.8%)
81	Epigastric pain and headache	57 (56.4%)
	Total	101 (100%)

4.5.5 Variables 82-84: Assessment of oedema in pregnant women with hypertension

Table 4.24 shows that n=92 (91.1%), of the participants indicated correctly the variable 'to assess distribution, degree and pitting oedema when assessing oedema in pregnant women with hypertension'. Sellers (2005:1165), substantiates that when assessing oedema in pregnant women with hypertension distribution, degree and pitting are assessed.

Table 4.24: How does one assess oedema in pregnant women with hypertension?

Variables	Assessing oedema in pregnant women with hypertension	n (%)
82	Assess distribution, degree and pitting	92 (91.1%)
83	Assess the sacral region for oedema	3 (3.0%)
84	Assess the existence of oedema on the abdomen	6 (5.9%)
	Total	101 (100%)

4.5.6 Variables 85-87: Instrument for measuring blood pressure

Table 4.25 shows the majority of the participants indicated correctly: n=81 (80%), selected manual sphygmomanometer and stethoscope as the instrument for measuring blood pressure to get the correct reading in pregnancy which is substantiated by Sellers (2005:1188). It is problematic that 20 (19.8%), have incorrectly answered this question.

Table 4.25: Instrument for measuring blood pressure

Variables	Instrument for measuring blood pressure	n (%)
85	Bimanual sphygmomanometer	1 (1.0%)
86	Manual sphygmomanometer and stethoscope	81 (80.0%)
87	Electronic blood pressure equipment	19 (18.8%)
	Total	101 (100%)

4.5.7 Variables 88-91: Factors affecting blood pressure reading

Table 4.26 shows that n=69 (68.3%), indicated correctly that position and measuring techniques are the major factors affecting blood pressure readings, while it is a concern that n=32(31.7%), answered incorrectly.

Huggins and De Swiet (2001:11) and Sellers (2005:1188), substantiate that position and measuring techniques are the major factors affecting blood pressure readings.

Table 4.26: Factors affecting blood pressure readings

Variables	Factors affecting blood pressure readings	n (%)
88	Alcohol consumption	9 (8.9%)
89	Excitement	19 (18.8%)
90	Position and measuring techniques	69 (68.3%)
91	Exercises	4 (4.0%)
	Total	101 (100%)

4.5.8 Variables 92-94: Appropriate position for correct reading of blood pressure

Table 4.27 shows that only n=39 (38.6%), of the participants answered correctly, while the majority n=62 (61.4%), answered incorrectly that the central position with arm at heart level is the most appropriate position for the correct reading of blood pressure. Peters and Flack (2003:210) and Huggins and De Swiet (2001:11), substantiate that the central position with arm at heart level is the most appropriate position for the correct reading of blood pressure.

Table 4.27: Most appropriate position for the correct reading of blood pressure

Variables	Most appropriate position for the correct reading of blood pressure	n (%)
92	Left lateral position	62 (61.4%)
93	Central with her arm at heart level	39 (38.6%)
94	Standing up position	0 (0%)
	Total	101 (100%)

4.5.9 Variables 95-96: Hypertension for the teenager with blood pressure of 130/85 mmHg

Table 4.28 shows most of the participants n=77 (76.2%), indicated correctly that a blood pressure of 130/85 mmHg for a teenager may be indicative of hypertension as supported by Sellers (2005:1188). However, 24(23.8%), have incorrectly answered this question.

Table 4.28: Hypertension for the teenager with a blood pressure of 130/85 mmHg

Variables	Hypertension for the teenager with a blood pressure of 130/85 mmHg	n (%)
95	Yes	77 (76.2%)
96	No	24 (23.8%)
	Total	101 (100%)

4.5.10 Variables 97-98: The baseline blood pressure of a pregnant woman should be determined in the first trimester of pregnancy

Table 4.29 shows that n=92 (91.1%), of the participants indicated correctly that it was preferable to determine the baseline blood pressure of a pregnant woman in the first trimester of pregnancy as substantiated by Nolte (1998:80).

Table 4.29: Is it preferable to determine the baseline blood pressure of a pregnant woman in the first trimester of pregnancy?

Variables	When to determine baseline blood pressure of a pregnant woman in the first trimester of pregnancy	n (%)
97	Yes	92 (91.1%)
98	No	9 (8.9%)
	Total	101 (100%)

4.5.11 Variable 99-100: Do you always use the same position when measuring blood pressure of a pregnant woman?

Table 4.30 shows that n=87 (86.1%), of the participants indicated correctly that nurses should always use the same position when measuring the blood pressure of a pregnant woman as substantiated by Sellers (2005:1188).

Table 4.30: Do you always use the same position when measuring the blood pressure of a pregnant woman?

Variables	Using the same position when measuring the blood pressure of a pregnant woman?	n (%)
99	Yes	87 (86.1%)
100	No	14 (13.9%)
	Total	101 (100%)

4.5.12 Variables 101-103: Type of test for pre-eclampsia

Table 4.31 shows that n=95 (94%), of the participants correctly answered that the preferred test for predicting pre-eclampsia was urine testing as substantiated by Cronje and Grobler (2006:505).

Table 4.31: Type of test for pre-eclampsia

Variables	Tests for pre-eclampsia	n (%)
101	Bulbs test	2 (2%)
102	None	4 (4%)
103	Urine testing	95 (94.0%)
	Total	101 (100%)

4.5.13 Variables 104-106: Body area for oedema dependency

Table 4.32 shows that all the participants, n= 101(100%), correctly answered that the feet, ankles and sacral region are body areas for dependent oedema in a pregnant woman as supported by Sellers (2005: 1165).

Table 4.32: Body area for oedema dependency

Variables	Body area for oedema dependency	n (%)
104	Hands, ankles and abdominal region	0 (0.0%)
105	Eyes, ankles, sacral region	0 (0.0%)
106	Feet, ankles and sacral region	101 (100.0%)
	Total	101 (100%)

4.5.14 Variables 107-109: Understanding pitting oedema

Table 4.33 shows that the majority of the participants n=89 (88.1%), correctly answered that they understood pitting oedema as the oedema that leaves a small depression after a finger is applied. However, 12(11.9%), answered incorrectly.

Table 4.33: Understanding pitting oedema

Variables	Understanding pitting oedema	n (%)
107	Oedema of lowest parts of the body	12 (11.9%
108	Oedema that leaves a small depression after a finger is applied	89 (88.1%)
109	Oedema most likely to occur in the sacral region	0 (0.0%)
	Total	101(100%)

Sellers (2005:1165), describes pitting oedema as the oedema that leaves a small depression after a finger is applied.

4.5.15 Variables 110-112: Grades used to assess deep tendon reflexes

Table 4.34 shows that only n=54 (53.4%), of the participants answered correctly that grades used to assess deep tendon reflexes are 1+,2+,3+ & 4+ as substantiated by Du Plessis (2007:38). It is problematic that 47(46.6%), answered incorrectly.

Table 4.34: Grades used to asses deep tendon reflexes

Variables	Grades used to asses deep tendon reflexes	n (%)
110	1+, 2+, 3+ and 4+	54 (53.4%)
111	- 1, - 2, - 3	13 (12.9%)
112	2%, 3% and 4%	34 (33.7%)
	Total	101 (100%)

4.5.16 Variables 113-115: Test for assessing fetal status

Table 4.35 shows the majority of the participants n=76 (75.2%), correctly answered that the test for assessing fetal status is a lung test for maturity and ultrasonography as supported by Fraser, Cooper and Nolte (2003:342).

Table 4.35: Test for assessing fetal status

Variables	Test for assessing fetal status	n (%)
113	Urinalysis	0 (0%)
114	Lung test maturity and ultrasonography	76 (75.2%)
115	Biophysical profile and fetal heart range	25 (24.8%)
	Total	101 (100%)

4.5.17 Variables 116-118: Laboratory tests to diagnose pre-eclampsia

Table 4.36 shows that n=100 (99%), of the participants correctly answered that the laboratory tests to diagnose pre-eclampsia are blood and urine specimen as supported by Cronje and Grobler (2006:505).

Table 4.36: Laboratory test to diagnose pre-eclampsia

Variables	Laboratory test(s) to diagnose pre-eclampsia	n (%)
116	Puss swab	0 (0.0%)
117	Puss swab and bloods	1 (1.0%)
118	Blood and Urine specimen	100 (99.0%)
	Total	101 (100%)

4.5.18 Variables 119-121: Why is a blood specimen obtained for hypertensive disorders?

Table 4.37 shows that n=79 (78.2%), of the participants indicated correctly that a blood specimen is obtained to monitor the disease process, hepatic functioning and effects on renal system as supported by Sellers (2005:1175).

Table 4.37: Why is a blood specimen obtained for hypertensive disorders?

Variables	Blood specimen for hypertensive disorders	n (%)
119	To monitor fetal growth	7 (6.9%)
120	To identify infection	15 (14.9%)
121	To monitor disease process, hepatic functioning and effects on renal system.	79 (78.2%)
	Total	101 (100%)

In conclusion to this section with reference to the knowledge about the diagnosis and assessment of hypertensive disorders, it can be noted that the males had a higher knowledge mean score (0.807) than the females (0.787). In addition the knowledge mean score of the basic one year diploma was the highest (0.794) followed by the 4 year degree (0.785) and the lowest 4-year diploma (0.784). The knowledge mean scores of the participants where there are no doctors' visits (0.809) are better than those who have doctors' visits (0.782). Participants who indicated that they do not have any doctors because they are competent had a lower score (0.785) than those who indicated the reason for not having a doctor is because there is a shortage of doctors (0.802).

4.6 SECTION D. MANAGEMENT OF HYPERTENSIVE DISORDERS IN PREGNANCY

4.6.1 Variables 122-124: Prevention of pre-eclampsia

Table 4.38 shows that only n=29 (28.9%), of the participants correctly answered that they advised patients to use low dose aspirin, calcium, magnesium and zinc to prevent pre-eclampsia. It is problematic that 72 (71.3%), answered incorrectly. Myers and Baker (2002:122) and Peters and Flack (2003:213), substantiate that the pregnant woman who is suffering from hypertensive disorders should be advised to use low dose aspirin, calcium, magnesium and zinc.

Table 4.38: Prevention of pre-eclampsia

Variables	Prevention of pre-eclampsia	n (%)
122	Use low dose aspirin, calcium, magnesium and zinc	29 (28.7%)
123	Encourage low protein and sodium intake	24 (23.8%)
124	Advice to pregnant woman to attend antenatal clinic at least every 3 months	48 (47.5%)
	Total	101 (100%)

4.6.2 Variables 125-127: Advice to women with pre-eclampsia regarding their diet

Table 4.39 shows n=83 (82.2%), of the participants correctly answered that the advice they give to patients with pre-eclampsia about their diet is the use of low salt and high protein as supported by Nolte (1998:295) and Sellers (2005:1170).

Table 4.39: Advice to women with pre-eclampsia regarding their diet

Variables	Advice to women with pre-eclampsia regarding their diet	n (%)
125	Use high sodium and high protein diet	1 (1.0%)
126	Use low salt and high protein diet	83 (82.2%)
127	Use vegetables and fish oil	17 (16.8%)
	Total	101 (100%)

4.6.3 Variables 128-130: Type of suitable relaxation for pregnant women with hypertension

Table 4.40 shows only n=34 (33.6%), of participants answered correctly that suitable relaxation for pregnant women is subdued light and bed rest as supported by Duley (2003:167). It is problematic that 67(66.3%), incorrectly answered this question.

Table 4.40: Type of suitable relaxation for pregnant women with hypertension

Variables	Suitable relaxation for pregnant women with hypertension	n (%)
128	Bed rest and stimulating environment	64 (63.4%)
129	Quiet environment and subdued light	3 (3.0%)
130	Subdued light and bed rest	34 (33.6%)
	Total	101 (100%)

4.6.4 Variables 131-133: Why encourage bed rest?

Table 4.41 shows n=85 (84.1%), of the participants answered correctly that bedrest improves utero-placental blood flow as supported by Nolte (1998:295).

Table 4.41: Why encourage bed rest?

Variables	Why encourage bed rest?	n (%)
131	To improve utero-placental blood flow	85 (84.1%)
132	To improve blood flow to the uterus	2 (2.0%)
133	To encourage growth of the fetus	14 (13.9%)
	Total	101(100%)

4.6.5 Variables 134-136: Consultation by midwife

Table 4.42 shows that n=60 (59.4%), of the participants answered correctly that pregnant women should consult the midwife on a weekly basis as supported by Cronje and Grobler (2006:491).

Table 4.42: Consultation by midwife

Variables	Consultation by midwife	n (%)
134	Once a month	16 (15.8%)
135	Twice a month	25 (24.7%)
136	Weekly	60 (59.4%)
	Total	101 (100%)

4.6.6 Variables 137-139: Treatment of pre-eclampsia

Table 4.43 shows that the majority of participants, n=96 (95%), correctly answered that magnesium sulphate, aldomet and hydrolazine may be prescribed for pre-eclampsia as supported by Fraser, Cooper and Nolte (2003:343).

Table 4.43: Treatment for pre-eclampsia

Variables	Treatment for pre-eclampsia	n (%)
137	Phenobarbitone	3 (3%)
138	Diuretics e.g. Lasix	2 (2.0%)
139	Magnesium sulphate, aldomet and hydralazine	96 (95.0%)
	Total	101 (100%)

4.6.7 Variables 140-142: Route to be used for the administration of magnesium sulphate

Table 4.44 shows that only n=27 (26.7%), of the participants correctly answered that magnesium sulphate may be administered intravenously or intramuscular as supported by Emery (2005:348) and Cronje and Grobler (2006:512). However, it is problematic that 74 (73.3%), answered incorrectly.

Table 4.44: Administration route for magnesium sulphate

Variables	Administration route for magnesium sulphate	n (%)
140	Intramuscularly only	9 (8.9%)
141	Intravenously or intramuscular	27 (26.7%)
142	Intravenously only	65 (64.4%)
	Total	101 (100%)

4.6.8 Variables 143-145: Time of referral for pregnant women with hypertensive disorders

Table 4.45 shows that only n=53 (52.5%), of the participants correctly answered that a pregnant woman should be referred when she is not responding to the management given by the midwife as supported by Cronje and Grobler (2006:494) and Sellers (2005:1170). However, it is problematic that 48 (47.5%), answered incorrectly.

Table 4.45: Time of referral for pregnant women with hypertensive disorder

Variables	Time of referral for pregnant women with hypertensive disorder	n (%)
143	When the woman is not responding to the management given by the midwife	53 (52.5%)
144	When the woman is presenting a rapid rise in blood pressure, rapid gain in weight and severe headache	45 (44.5%)
145	When the woman presents with oliguria	3 (3%)
	Total	101 (100%)

In conclusion to this section with reference to the knowledge about the management of hypertensive disorders, it is noted that the males had a higher knowledge mean score (0.605) than the females (0.512). In addition the knowledge mean score of the 4 year degree was the highest (0.544) followed by the 4 year diploma (0.534) and the lowest the basic one year diploma (0.514). The knowledge mean scores of the participants where there are no doctors' visits (0.544) are better than those who have doctors' visits (0.517). Participants who indicated that they do not have any doctors because they are competent had a higher score (0.589) than those who indicated the reason for not having a doctor is because there is a shortage of doctors (0.507). A significant statistical association has been identified between period of experience and the management of hypertensive disorders using the Spearman statistical test (p=0.02).

4.7 CONCLUSION

The purpose of this chapter was to present the findings of the study investigated scientifically about the knowledge of the registered midwives managing hypertensive disorders in pregnancy working at Primary Health Care level in the Buffalo City Local Service Area of the Eastern Cape. This goal as set was reached together with the specific objectives namely to determine whether the registered midwives working in Primary Health Care have adequate knowledge about:

- hypertensive disorders in pregnancy (Section B)
- the diagnosis and assessment of hypertensive disorders in pregnancy (Section C)
- the management of hypertensive disorders in pregnancy (Section D).

In chapter 5 discussion about the data analysis, conclusions and recommendations of the specific objectives will be discussed.

CHAPTER 5: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter the researcher presents a discussion on the data analysis, conclusions with reference to the findings and various recommendations based on the scientific evidence obtained from this study.

Peters and Flack (2003:209), as described in paragraph 1.2, identified in their research studies that hypertensive disorders are a serious problem complicating 6% to 8% of all pregnancies. They conclude that nurses working in outpatient home care and acute care settings must be vigilant when assessing pregnant women so that hypertensive problems are identified early and treated promptly. Furthermore, nurses must have knowledge about the procedures required to ensure accuracy and to make informed decisions based on this knowledge. Adequate management of these women will promote the safe and healthy delivery. Furthermore, hypertensive disorders are the major contributor to maternal and infant morbidity and mortality rates as described in paragraph 1.2.

5.2 DISCUSSION

5.2.1 Biographical data

The findings show that the majority of the participants working in the clinics where the research was conducted are older than 40 years of age (66.3%). The staff component of registered midwives shows an aging /midwifery population in the Buffalo City Local Service Area. The majority of the participants were female (87.1%), this distribution shows the dominance of females in the profession which is substantiated by Kelly (2006:27). The clinics showed a qualification mix between the participants, namely a one year basic diploma in midwifery (52.4%), 4-year comprehensive nursing diploma (32.6%) and 4 year nursing degree (13.9%) however, only one (1.0%) participant was qualified as an advanced midwife.

The participants with a One Year Basic Midwifery Diploma in Nursing obtained the highest knowledge score as shown in figure 4.1, followed by the 4-year diploma and then the 4year degree. All the participants regardless of the specific programme they have followed completed their midwifery according to Regulation 254 Basic Midwifery as promulgated by the Nursing Act 50 of 1978. It would therefore have been expected that participants who hold a degree qualification would have obtained better scores. However, a possible reason why the one-year basic diploma

obtained the highest scores could be attributed to the continuous practice in midwifery while the 4 year diploma/degree students have an interrupted midwifery programme.

A statistical correlation was shown between the presence of doctors and the knowledge of the midwives using the Mann-Whitney statistical test (p=0.04). In clinics where there are no doctors' visits the knowledge of the staff was higher (0.691) than the total knowledge mean score (0.666). Where doctors are regularly visiting the clinics the mean knowledge score is lower (0.656), than the total knowledge mean. However, it was identified that the participants who indicated that they are competent have a lower knowledge mean (0.669), than those who indicated that there is a shortage of doctors (0.683). These results show that where midwives do not have any additional support as when there are doctors' present, individual effort is made to keep up to date as they are practising as independent practitioners.

5.2.2 Section B: Objectives of the study

5.2.2.1 To determine whether the registered midwives working in Primary Health Care have adequate knowledge about hypertensive disorders in pregnancy (Section B)

The knowledge and understanding of the midwife about hypertensive disorders in pregnancy cannot be emphasised enough. This is currently still one of the major contributors towards maternal and infant morbidity and mortality (See paragraph 1.2). The results obtained in this section show that inadequate knowledge does exist among the midwives who participated in this study. The findings obtained related to this objective show that 25-40% of the questions were incorrectly answered. Despite the fact that no statistical significance was shown between knowledge and hypertensive disorders it is a concern that such poor results were obtained on a disorder of such critical importance in the clinical environment. This is substantiated by the findings of the following questions about hypertensive disorders: It was identified that midwives (33.7%) were not able to define a hypertensive disorder, in addition 27.7% of participants had no understanding about pre-eclampsia. A major risk factor associated with the development of pre-eclampsia is obesity, however, 43.6% incorrectly answered this question. Furthermore, the effect of pre-eclampsia on the mother and fetus were poorly answered namely, 36.6% and 10.9% respectively do not know these effects. The results are further verified by the fact that the knowledge means score of the participants (0.587) where there are no doctors' visits are better than those who have doctors' visits (0.529). These results show that where the midwives practise independently without the support of a doctor they tend to ensure that they deliver a safe practice by keeping their knowledge up to date. However in clinics where they have the support of doctors, the knowledge is poorer. A Man-Whitney statistical test shows a significant statistical association

between the knowledge of staff in clinics where doctors are visiting regularly and where there are no visits (p=0.04).

It can therefore be concluded that the knowledge of the midwives about hypertensive disorders in pregnancy are inadequate.

5.2.2.2 To determine whether the registered midwives working in primary health care setting have adequate knowledge about the assessment and diagnosis of hypertensive disorders in pregnancy (Section C).

The assessment of a pregnant woman is of critical importance as a misdiagnosis may result in severe complications and even death. The results obtained in this section varied but shows that inadequate knowledge does exist among the midwives who participated in this study.

Table 4.20 shows that 21.8%, was not able to give the correct answer that renal diseases and diabetes mellitus are subjective data that must be collected pertaining to medical history. Furthermore 27.7%, as shown in table 4.21, was not able to give the correct answer that the research into social history should include drug abuse, alcohol and smoking. These are important aspects of history taken during the assessment phase to prevent complications (See paragraph 2.8.).

Results also show that the knowledge of participants is inadequate with regard to the clinical manifestations of pre-eclampsia with which a patient presents. Table 4.22 shows that 43.6% of the participants failed to correctly indicate that epigastric pain and headache are clinical manifestations of severe pre-eclampsia. In addition there are participants who failed to answer correctly that manual sphygmomanometer and stethoscope are the instruments for measuring blood pressure to get the correct reading in pregnancy. Results obtained also show that 31.7% of the participants failed to indicate that the position and measuring techniques are major factors affecting blood pressure readings. In measuring blood pressure, table 4.28 shows that 23.8% failed to identify that a blood pressure of 130/85 mmHg for a teenager may be indicative of hypertension. The appropriate technique for blood pressure taking is of extreme importance as this is the core to the diagnosis of hypertension.

In this section the knowledge mean scores of the participants where there are no doctors' visits (0.809), are better than those who have doctors' visits (0.782). Participants who indicated that they do not have any doctors because they are competent had a lower score (0.785), than those who indicated the reason for not having a doctor is because there is a shortage of doctors (0.802). Again the results show that where doctors are regularly visiting the clinics the midwives tend to be less responsible in terms of updating their knowledge in midwifery and a false idea of them being competent is problematic.

The researcher therefore concludes that the knowledge of midwives about the assessment and diagnosis of patients with a hypertensive disorder is inadequate.

5.2.2.3 To determine whether the registered midwives working in Primary Health Care have adequate knowledge about the management of hypertensive disorders in pregnancy (Section D).

It is problematic that 72 (71.3%), are not able to advise the pregnant woman who is suffering from hypertensive disorders to use low dose aspirin, calcium, magnesium and zinc as substantiated by Myers and Baker (2002:122) and Peters and Flack (2003:213). In addition 17.8% of the participants failed to show that they advise patients with pre-eclampsia to use a low salt and high protein diet as supported by Nolte (1998:295) and Sellers (2005:1170). Only 33.6% of participants answered correctly that suitable relaxation for pregnant women is subdued and bed rest is light as supported by Duley (2003:167) as shown in table 4.40.

Only (26.7%) of the participants correctly answered that magnesium sulphate may be administered intravenously or intramuscular as supported by Emery (2005:348) and Cronje and Grobler (2006:512). However, it is problematic that (73.3%) answered incorrectly. Results further show that 41% of the midwives do not have the knowledge of how often a patient with a hypertensive disorder should consult a midwife.

The knowledge mean scores of the participants pertaining to this section show that where there are no doctors' visits knowledge scores are better (0.544), than those who have doctors' visits (0.517). This result shows the responsibility towards patient safety of the independent individual practitioner who has no support of a medical doctor in the clinical environment, in maintaining her knowledge level about the management of the patients with a hypertensive disorder. A significant statistical association has been identified between period of experience and the management of hypertensive disorders using the Spearman statistical test (p=0.02).

The researcher concludes that the knowledge of registered midwives working in primary health care who are managing hypertensive disorders in pregnancy is inadequate.

5.3 RECOMMENDATIONS

Recommendations are based on the scientific evidence obtained in this study and is especially made to the relevant stakeholders in policymaking and training of midwives.

These recommendations will focus on the improvement of the knowledge of registered midwives with regard to the assessment, diagnosis and management of hypertensive disorders in pregnancy. The implementation of these recommendations may have a positive influence in

decreasing the maternal and neonatal morbidity and mortality rates. Emphasis is placed on the early detection and management of hypertensive disorders at primary health care level.

5.3.1 Responsibility of Policy makers and Health Service providers

It is the responsibility of the policy makers and health service providers to ensure that the registered midwives are provided with the necessary opportunity to improve their knowledge and skills in how to assess, diagnose and effectively manage hypertensive disorders in pregnancy.

5.3.1.1 Attendance of workshops, congresses, conferences and symposiums

The attendance of regular annual workshops, congresses, conferences and symposiums should be made essential for all midwives.Midwives should be given these learning opportunities on a rotating basis and reports should be compulsory and be made available to all.

5.3.1.2 Regular update and in-service training

Midwives should be given a regular update on a monthly basis on new developments in midwifery. With the introduction soon of the regulation regarding continuous professional development as will be promulgated by the Nursing Act 33 of 2005, opportunities should be created for the midwives to continuously improve their knowledge. In-service training should be given on a weekly basis.

5.3.1.3 Competency in practical skills

Basic procedures such as taking a blood pressure should not be seen as a ritual but a core function in diagnosing a hypertensive disorder. Regular demonstrations and testing for competence in taking blood pressures should be done by external evaluators or with the support of a university. The interpretation of readings and related problems should also be evaluated.

5.3.1.4 Formal education training

A concerted effort should be made by the national or provisional departments of health to ensure that all obstetric units in primary health care facilities be managed by trained advanced midwives. Study opportunities together with bursaries should be made available annually to midwives to complete a post-graduate qualification in advanced midwifery.

5.3.2 Quality assurance programmes

The introduction of a quality assurance programme will provide each clinic with specific indicators against which the quality of the service will be measured. A specific roster designed for regular

quality assurance audits of the clinics should be undertaken. This should be done on a monthly basis by the unit manager and at least three monthly by the district managers.

5.3.2.1 Incentives for improving knowledge and skills

Incentives should be introduced for those midwives who on an individual basis show excellence in patient care. Specific criteria should be set against which midwives will be measured. By introducing these incentives it will contribute positively towards patient care.

5.3.2.2 Incentives for primary health care facilities

Indicators to monitor the quality of care in a primary health care facility should be identified and monitored such as high maternal and fetal morbidity rates, complications and misdiagnosis. The introduction of patient satisfaction surveys on a regular basis contribute to the quality of care being given. It is recommended that these surveys be done monthly.

Clinics should be rewarded for outstanding achievements regarding patient care. By bringing awareness about the quality of patient care being given, which includes detailed assessment, accurate diagnosis and efficient and effective management, it is probable also that this will lead to a decrease in morbidity and mortality rates.

5.3.2.3 Guidelines, policies and procedures

The development of the required guidelines, policies and procedures should be in place to guide the staff in how to manage patients with reference to all aspects of patient care. These guidelines, policies and procedures should be generic to all primary health care clinics and be available and easily accessible to all midwives. Policies should include an appropriate referral system available in every community health service (clinic) to ensure early referral of women with signs of hypertensive disorders in pregnancy.

5.3.3 Patient education

5.3.3.1 Education programme

A patient education programme emphasising conditions and complications during pregnancy should be available in all the clinics. Booklets, pamphlets and brochures guiding the pregnant woman should be made available to every new obstetric patient. This guide should inform the patient of expectations, problems, do’s and don’ts during pregnancy, substance and alcohol abuse, smoking and any clinical manifestation of any condition. The use of posters in the clinics and viewing DVDs

while waiting adds to the knowledge base of the patient. The early detection of clinical manifestations is critical to ensure adequate management.

5.3.3.2 Community interaction

The role of the midwife is critical in ensuring that healthy bouncing babies are born. Therefore the midwife's role in the community cannot be underestimated as she plays a pivotal role in teaching women about a healthy pregnancy. Seminars, workshops and health days emphasising a healthy pregnancy should regularly be undertaken. The midwife should take ownership of the health of the women of the community the clinic serves.

5.3.4 Evidence based research

This study has provided a bench mark about the knowledge of midwives in primary health care facilities. It is possibly the "tip of the iceberg" about what midwives know about the conditions they manage in the clinical environment. A compounding effect may exist with reference to all conditions, that existing knowledge of midwives are questioned. Further research is therefore recommended for all conditions being managed by the midwife.

5.4 CONCLUSION

The research question which guided this study "Do the registered midwives working at Primary Health Care level have adequate knowledge about the management of hypertensive disorders in pregnancy?" has been answered. This research question was scientifically investigated and it is concluded based on the evidence that the midwives working in primary health care do not have adequate knowledge about hypertensive disorders in pregnancy.

By empowering the midwife it will result in early detection and management of hypertensive disorders at primary health care level. The midwives should therefore be knowledgeable and competent in the assessment and identification of pregnant women who are at risk of developing hypertensive disorders and management of those who have been identified (Motherhood Programme, 1999-2001:71).

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Annexure A:

QUESTIONNAIRE

Title: An evaluation of the knowledge of registered midwives managing hypertensive disorders in pregnancy at Primary Health Care level in the Eastern Cape.

Goal of the Study

The goal of this study is to evaluate the knowledge of midwives managing hypertensive disorders in pregnancy at Primary Health Care level.

All information will be treated as confidential and the researcher undertakes not to reveal any individual information that appears in this questionnaire.

To complete this 8 page questionnaire will take approximately 30 minutes. All you need to do is to mark off with a cross (x) your most appropriate response(s) as illustrated in the example below.

EXAMPLE

8	4 year degree in General Nursing and Midwifery (Psychiatry & Community Health science)	
9	4 years diploma in General Nursing and Midwifery (Psychiatry & Community Health science)	X
10	1 year basic diploma in Midwifery	
11	Advanced diploma in Midwifery	
12	Other(s) Specify	

SECTION A: BIOGRAPHICAL DATA

1. What is your age?

1	≥ 21 ≤ 30 years	
2	> 30 years ≤ 40 years	
3	> 40 years ≤ 50 years	
4	> 50 years ≤ 60 years	
5	> 60 years	

2. What is your Gender?

6	Male	
7	Female	

3. Indicate your qualification(s) in midwifery?

8	4 year degree in General Nursing and Midwifery (Psychiatry & Community Health Science)	
9	4 years diploma in General Nursing and Midwifery (Psychiatry & Community Health Science)	
10	1 year basic diploma in Midwifery	
11	Advanced diploma in Midwifery	
12	Other(s) Specify	

4. Indicate the duration of your experience as a midwife?

13	≤ 6 months	
14	> 6 months ≤ 3 years	
15	> 3 years ≤ 5 years	
16	> 5 years ≤ 7 years	
17	> 7 years	

5. Indicate the length of your (current) experience as a midwife at this clinic?

18	≤ 6 months	
19	> 6months ≤ 1 year	
20	>1 year ≤ 3 years	
21	> 3 years ≤ 5 years	
22	> 5 years	

6. Do doctors regularly visit the clinic?

23	Yes	
24	No	

7. If you answered "yes" to question 6, how often does a doctor visit the clinic?

25	Daily	
26	Once a week	
27	Once a month	
28	Other(s) Specify	

8. If you answered "No" to question 6 indicate why do you think this is not happening?

29	Clinic is inaccessible	
30	Midwives are competent	
31	Shortage of doctors	
32	Other(s) Specify	

9. How many clients on average attend the antenatal clinic per day?

33	**<**15	
34	≥ 15 < 20	
35	≥ 20 < 50	

36	≥ 50 < 60	
37	≥ 60	

10. How many registered midwives are working currently in the clinic?

38	1	
39	2	
40	3	
41	4	
42	5	

SECTION B: KNOWLEDGE OF HYPERTENSIVE DISORDERS IN PREGNANCY

Choose the most appropriate response(s).

11. Indicate how you would define hypertension in pregnancy?

43	Systolic blood pressure ≥ 140mmhg or diastolic blood pressure ≤ 90mmHg or mean arterial pressure ≥ 105mmHg	
44	Systolic blood pressure ≥ 120mmHg or diastolic blood pressure ≥ 100mmHg or mean arterial pressure ≥ 100mmHg	
45	Systolic blood pressure ≥ 130mmHg or diastolic blood pressure ≥ 100mmHg or arterial pressure ≥ 105mmHg.	

12. Indicate the most appropriate definition of gestation hypertension

46	Onset of hypertension without proteinuria, after 20 weeks of pregnancy?	
47	Onset of hypertension 2+ + of proteinuria within 20 weeks pregnancy?	
48	Onset of hypertension 2+ + of protein after 35 weeks of pregnancy?	

13. Indicate the most appropriate definition of chronic hypertension in pregnancy

49	Hypertension develops after 20 weeks of gestation and characterised by hypertension and proteinuria.	
50	Hypertension present before the pregnancy or diagnosed before 20 weeks of gestation.	
51	Presence of systolic blood pressure ≥ 160mmHg or diastolic blood pressure ≥ 110 mmHg and proteinuria > 29/24 hr urine specimen or ≥ 2+ on dipstick	

14. Define proteinuria

52	Urine concentration of ≤ 30mg/dl or more in at least 3 hours apart with no evidence of infection.	
53	Urine concentration of ≤ 40mg/dl or more in at least 4hours apart with evidence of urinary tract infection	
54	Urine concentration of ≥ 30mg/dl in at least two random urine specimens collected at least 6 hours apart with no evidence of urinary tract infection.	

15. What is eclampsia?

55	Hypertension present before pregnancy	
56	Onset of seizure activity in the woman diagnosed with pre-eclampsia	
57	Onset of hypertension, without proteinuria after 20 weeks of pregnancy	

16. What is your understanding of pre-eclampsia?

58	Hypertension develops after 20 weeks of gestation and is characterised by hypertension and proteinuria	
59	Hypertension develops after 28 weeks of gestation	
60	Hypertension develops within 28 weeks of gestation and is characterised by proteinuria and hypertension	

17. Indicate the major risk factor associated with the development of pre-eclampsia

61	Pneumonia	
62	Cardiac diseases	
63	Obesity	

18. Indicate the maternal effects of pre-eclampsia

64	Intra-uterine growth retardation and convulsions	
65	Epigastric pain and visual problems	
66	Aggressiveness and irritability	

19. Indicate the fetal effect of pre-eclampsia

67	Urinary output decrease	
68	Epigastric pain	
69	Reduced placental perfusion	

SECTION C: ASSESSMENT AND DIAGNOSIS OF HYPERTENSIVE DISORDERS IN A PREGNANT WOMAN

Choose the most appropriate response(s)

20. Indicate which subjective data you will collect pertaining to the medical history

70	Fetal movements	
71	Cultural believes	
72	Renal diseases, diabetes mellitus	

21. Indicate which aspects about her social history you will ask the pregnant woman

73	Smoking, renal disease and chronic hypertension	
74	Diabetes, pregnancies after donor insemination	
75	Drug abuse, alcohol and smoking	

22. Indicate the clinical manifestations of pre-eclampsia

76	Weight loss, abnormal blood pressure ≥ 160mmHg of systolic blood pressure	
77	Blood pressure changes from baseline, abnormal weight gain	
78	Presence of edema and protein in urine.	

23. Indicate the clinical manifestations of severe pre-eclampsia

79	Palpitations and tiredness	
80	Headache, backache and sweating	
81	Epigastric pain and headache	

24. How do you assess edema in a pregnant women with hypertension?

82	Assess distribution, degree and pitting	
83	Assess the sacral region for edema	
84	Assess the existence of edema on the abdomen	

25. What instrument(s) do you use to measure the blood pressure to get the correct reading in pregnancy?

85	Bimanual sphygmomanometer	
86	Manual sphygmomanometer and stethoscope	
87	Electronic blood pressure equipment	

26. Which of the following factor(s) affect blood pressure readings?

88	Alcohol consumption	
89	Excitement	
90	Position and measuring techniques	
91	Exercises	

27. What is the most appropriate position for the correct reading of blood pressure?

92	Left lateral position	
93	Central with her arm at heart level	
94	Standing up position	

28. For the teenager a blood pressure of 130/85 mmHg may be indicative of hypertension

95	Yes	
96	No	

29. It is important to determine the baseline blood pressure of a pregnant woman in the first trimester of pregnancy

97	Yes	
98	No	

30. You must always use the same position when measuring the blood pressure of a pregnant woman

99	Yes	
100	No	

31. Which test could be used as a routine screening tool for predicting pre-eclampsia?

101	Bulbs test	
102	None	
103	Urine testing	

32. In which areas of the body do you find dependent edema in a pregnant woman?

104	Hands, ankles and abdominal region	
105	Eyes, ankles, sacral region	
106	Feet, ankles and sacral region	

33. What is pitting edema?

107	Edema of lowest parts of the body	
108	Edema that leaves a small depression after a finger is applied to it	
109	Edema most likely to occur in the sacral region	

34. Which grades can be used to assess deep tendon reflexes?

110	1+, 2+, 3+ and 4+	
111	- 1, - 2, - 3	
112	2%, 3% and 4%	

35. Which test can be done to assess fetal status?

113	Urinalysis	
114	Lung test maturity and ultrasonography	
115	Biophysical profile and fetal heart range	

36. Which laboratory test(s) would you do for diagnosis of pre- eclampsia?

116	Puss swab	
117	Puss swab and bloods	
118	Blood and Urine specimen	

37. Why is a blood specimen obtained for hypertensive disorders?

119	To monitor fetal growth	
120	To identify infection	
121	To monitor disease process, hepatic functioning and effects on renal system.	

SECTION D: MANAGEMENT OF HYPERTENSIVE DISORDERS IN PREGNANCY

Choose the most appropriate response(s)

38. How will you prevent pre-eclampsia?

122	Use low dose aspirin, calcium, magnesium and zinc intake	
123	Encourage low protein intake and encourage sodium intake	
124	Advice to pregnant woman to attend antenatal clinic at least every 3 months	

39. What dietary advice can you give to a woman with pre-eclampsia?

125	Use high sodium and high protein diet	
126	Use low salt and high protein diet	
127	Use vegetables and fish oil	

40. To encourage relaxation in pregnant women with hypertension what would you recommend?

128	Bed rest and stimulating environment	
129	Quiet environment and subdued light	
130	Subdued light and bed rest	

41. Why would you encourage bed rest?

131	To improve utero-placental blood flow	
132	To improve blood flow to the uterus	
133	To encourage growth of the fetus	

42. How often should the midwife see a pregnant woman who is presenting with a hypertensive disorder?

134	Once a month	
135	Twice a month	
136	Weekly	

43. What treatment would you prescribe for pre-eclampsia?

137	Phenobarbitone	
138	Diuretics e.g. Lasix	
139	Magnesium sulfate, aldomet and hydralazine	

44. By which route should magnesium sulfate be administered?

140	Intramuscularly only	
141	Intravenously or intramuscular	
142	Intravenously only	

45. When should the midwife refer a pregnant woman presenting with a hypertensive disorder?

143	When the woman is not responding to the management given by the midwife	
144	When the woman is presenting with rapid rise in blood pressure, rapid gain in weight and severe headache	
145	When the woman presents with oliguria	

Thank you.

Nompumelelo Nkwekazi
M Cur Student
Cell No: 0739719863

Annexure B: Approval for project

19 November 2008

Ms NL Ngwekazi
Division of Nursing
Dept of Interdisciplinary Health Sciences

Dear Ms Ngwekazi

RESEARCH PROJECT : "AN EVALUATION OF THE KNOWLEDGE OF THE REGISTERED MIDWIVES MANAGED HYPERTENSIVE DISORDERS AS PRIMARY HEALTH CARE LEVEL IN THE EASTERN CAPE"
PROJECT NUMBER : N08/06/178

It is my pleasure to inform you that the abovementioned project has been provisionally approved on 18 November 2008 **for a period of one year from this date**. You may start with the project, but this approval will however be submitted at the next meeting of the Committee for Human Research for ratification, after which we will contact you again.

Notwithstanding this approval, the Committee can request that work on this project be halted temporarily in anticipation of more information that they might deem necessary to make their final decision.

Please quote the abovementioned project number in all future correspondence.

Please note that a progress report (obtainable on the website of our Division) should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly and subjected to an external audit.

Federal Wide Assurance Number: 00001372
Institutional Review Board (IRB) Number: IRB0005239
The Committee for Human Research complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Kind regards

pp
Prof PJT de Villiers
Chairperson: Committee for Human Research
RESEARCH DEVELOPMENT AND SUPPORT (TYGERBERG)
Tel +27 21 938 9207 / E-mail: mertrude@sun.ac.za
Copy to Supervisor: Dr E Stellenberg

Annexure C: Approval from the Department of Health

Ikamva eliqaqambileya!

Eastern Cape Department of Health

Enquiries: Vuyokazi Poswayo
Tel No: 083 378 1769/ 040 608 0804
Date: 24 March 2009
Fax No: 043 642 1409
e-mail address. vuyo.poswayo@yahoo.com

Dear Ms Ngwekazi

Re: An evaluation of the knowledge of the registered midwives managing hypertensive disorders at primary health care level in the Eastern Cape

The Department of Health would like to inform you that your application for conducting a research on the abovementioned topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.
2. You are advised to ensure observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants. You will not impose or force individuals or possible research participants to participate in you study. Research participants have a right to withdraw anytime they want to. However, you shall be responsible in dealing with any adverse effects following the research treatment provided in your study.
3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Epidemiological Research & Surveillance Management. You may be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

V Poswayo

EPIDEMIOLOGICAL RESEARCH & SURVEILLANCE MANAGEMENT DATE 25/03/09

Annexure D: Participant information leaflet and consent form

TITLE OF THE RESEARCH PROJECT:

AN evaluation of the knowledge of the registered midwives managing hypertensive disorders at the Primary Health Care level in the Eastern Cape.

REFERENCE NUMBER: 14486148

PRINCIPAL INVESTIGATOR: L.N. Ngwekazi

ADDRESS:
P. O. Box 4381
King William's Town
5600

CONTACT NUMBER:

Home: 043 642 6625
Cell: 073 971 9863
Work: 043 709 2411

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Committee for Human Research at Stellenbosch University **and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.**

What is this research study all about?
This study will be conducted at Buffalo Local Service area. The purpose of this study is to investigate scientifically the knowledge of the midwives working at Primary Health Care level regarding hypertensive disorders in pregnancy.
OBJEECTIVES

- To determine whether the knowledge of midwives working in Primary Health Care regarding the assessment in pregnancy for hypertensive disorders is adequate.
- To determine whether the midwives working in Primary Health Care are able to diagnose a hypertensive disorder in pregnancy.

- To determine whether the knowledge of midwives working in Primary Health Care in the management of hypertensive disorders in pregnancy are adequate

Population for this study will consist of registered midwives working in the Buffalo City Local Service Area, both in the rural and urban clinics.
Data will be collected by means of a structured questionnaire consisting of mostly closed ended questions. Questionnaires will be distributed to individual midwives personally for completion and will be collected separately from the consent form by the researcher on the same day. All data will be managed anonymously, be accessible only to the researcher and will be discarded after the completion of the study.

Why have you been invited to participate?
You have been invited to participate in this study being one of the students who are regularly placed into the Primary Health Care Level.

What will your responsibilities be?
You will participate in this study by filling in the questionnaire within ten (10) minutes and handing it over to the student researcher on the same day.

You will be asked to sign the attached consent form as proof of agreement to participate before you can fill the questionnaire. This is an important document to show that you freely agreed to participate.

Will you benefit from taking part in this research?
You have no specific benefit by participating in the study, on. The results of the study might possibly contribute to the development of the registered midwives in the province and the country in general.

Are there in risks involved in your taking part in this research?
There is no foreseen risk that is related to your participation in this project. The information you will provide will be totally anonymous. Consent form and questionnaire will be placed in separate envelopes.

If you do not agree to take part, what alternatives do you have?
This is a voluntary participation and has no repercussion should you do not participate. The information you provide will be kept confidential and all records destroyed after conclusion. There will be no name on the questionnaire only a number will be used to guide the data analysis.

What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?

There is no risk of injury related to your participation in this study.

Will you be paid to take part in this study and are there any costs involved?
No, you will not be paid to take part in the study. There will also be no costs involved for you, if you do take part. You are freely volunteering to help the student with information for her Master's Degree.

Is there any thing else that you should know or do?

- You can contact Dr EL Stellenberg at: 0219389244. If you have any further queries or encounter any problems.
- You can contact the Committee for Human Research at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by your study doctor.
- If you agree to participate you will be expected to sign the consent form

Declaration by participant

By signing below, I …….. agree to take part in a research study entitled "An evaluation of the knowledge of the registered midwives managing hypertensive disorders at the Primary Health care Level in the Eastern Cape.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) ..... on (*date*) …….. 2008.

Signed at (*place*) ..... on (*date*) …….. 2005.

…….. ……..

Signature of investigator Signature of witness

Declaration by investigator

I *(name)* …… declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a interpreter. (*If a interpreter is used then the interpreter must sign the declaration below.*

Signed at (*place*) .....……. on (*date*) ……..…….. 2005.

…… ……..
Signature of investigator Signature of witness

Declaration by interpreter

I *(name)* …… declare that:

- I assisted the investigator (name) …… to explain the information in this document to (name of participant) ……. using the language medium of Afrikaans/Xhosa.
- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) .....……. on (*date*) ……..…….. 2005.

Declaration by interpreter

I *(name)* …… declare that:

- I assisted the investigator (name) …… to explain the information in this document to (name of participant) ……. using the language medium of Afrikaans/Xhosa.
- We encouraged him/her to ask questions and took adequate time to answer them.

- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) .....…..…….. on (*date*) ……...…….. 2005.

…….
Signature of interpreter

……..
Signature of witness