# COMPETENCE OF MIDWIVES REGARDING PREVENTION OF LOW APGAR SCORE AMONG NEONATES

by

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## DECLARATION

I, SEANI ADRINAH MULONDO, hereby declare that the dissertation for the MAGISTER CURATIONIS degree at the University of Venda, hereby submitted by me, has not been submitted previously for a degree at this or any other university, that it is my own work in design and in execution, and that all reference material contained therein has been duly acknowledged.

.....Mulondo.....

**SIGNATURE**

**(MRS S A MULONDO)**

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# DEDICATION

This work is dedicated to my daughters Tshidziwani and Murangi, my son Tshilidzi, and all midwives in the Republic of South Africa.



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# ABSTRACT

The practice of obstetric nursing requires a midwife practitioner who is competent and practises independently in providing antenatal services during pregnancy, the progress of labour and conducts delivery on her own for a normal healthy baby with an Apgar score of 10/10 at one minute after birth. Mismanagement of labour and lack of delivery technique commonly lead to a low Apgar score of 7 or less at 5 minutes. The incidences of high or low statistics of babies born with low Apgar scores depend upon the competence of midwives in the management process prior to conception, during pregnancy, labour and neonatal care.

The purpose of the study was to assess the competence of midwives regarding the prevention of low Apgar scores among neonates. The objectives of the study were to determine the competence of midwives with regard to the prevention of low Apgar scores, to assess the knowledge of midwives regarding the prevention of low Apgar scores among neonates and to determine the opinions of midwives regarding the prevention of low Apgar scores among neonates.

The study was designed as a quantitative, descriptive research which was conducted to determine the competence of midwives regarding the prevention of low Apgar scores among neonates in the Vhembe district of Limpopo Province. A representative sample of 100 midwives working in the maternity units of three district hospitals was selected. Data was collected in March 2007 to April 2007. A self-administered questionnaire with closed and open-ended questions was used to collect data. Participants were selected using a nonprobability purposive sampling method. The findings revealed that midwives perceived themselves to be competent in performing most of the midwifery skills and furthermore knew how to perform some of the skills related to midwifery care. However, they perceived themselves to be incompetent in performing some critical skills and lacking in knowledge of some skills related to midwifery care such as taking and recording blood pressure correctly.



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One of the recommendations of the study was that standardised clinical guidelines should be included in the structured learning curriculum for undergraduate nurses. The recommendations were relevant to midwifery practice, nursing management and nursing education, and included recommendations for future research. The problem of low Apgar score needs to be researched in order to find solutions to it as it may have an impact on the midwives who are responsible for maternal and childcare services, parents of babies with low Apgar scores, the community and the Government, and the Department of Health concerned.



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**Key concepts were:**

- Apgar score
- Low Apgar score
- Midwife
- Neonate
- Labour
- Competence and
- Maternity



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# LIST OF ABBREVIATIONS

| | |
|---|---|
| ANC | A National health plan |
| ANMC | Australian Nursing and Midwifery Council |
| BMI | Body Mass Index |
| C | Competent |
| C/S | Caesarian section |
| CMP | Community Midwifery Programme |
| CHBH | Chris Hani Baragwaneth Hospital |
| INC | Incompetent |
| MIS | Missing |
| MRC | Medical Research Council |
| NICU | Neonatal Intensive Care Unit |
| PPIP | Perinatal Problem Identification Programme |
| SANC | South African Nursing Council |
| UKCC | United Kingdom Central Council |
| USA | United State of America |
| WHO | World Health Organisation |



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# CHAPTER 1

# ORIENTATION TO THE RESEARCH STUDY

## 1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

Health professionals and midwives in particular, play an important role in rendering maternal and childcare services, including neonatology. The lives of both mother and baby are in their hands from conception until delivery of the baby (Myles, Fraser & Cooper, 2004:5). Midwives are responsible for the management of a pregnant woman during antenatal clinic, labour, puerperium and including neonatal care. They have to acquire knowledge of obstetric practice because in the management process they are exposed to various challenges such as conditions affecting pregnancy, difficult labour and resuscitation of hypoxic neonates (MacDonald & Van Der Walt, 2003:54).

It is the responsibility of the midwife to ensure that a woman gives birth to a healthy newborn baby with an Apgar score of 10/10 at one minute after birth. The Apgar score is a method that was introduced by an American anaesthetist called Virginia Apgar in 1953. The scoring system was intended to evaluate and record the physical condition of the baby in numerical terms at one minute after birth and if necessary it may be repeated at five minutes (Myles *et al.*, 2004:318).

Physical assessment is done immediately after birth at one minute, under five vital points including skin colour, respiratory effort, heartbeat, muscle tone and response to stimuli and each is given a score of 0, 1 or 2, depending on the findings. For example, a skin colour score of 2/2 is given if the whole body is completely pink, 1 if extremities are blue and the body is pink and 0 if the whole body is blue or pale, implying lack of oxygen supply in the body and the total score of 10/10 is given, derived from the summation of the five vital signs as indicated in **Table 1.1** (Sellers, 2001a:501).



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**Table 1.1 Apgar scoring system chart adopted from Sellers (2001a:502)**

| APGAR SCORING CHART | | | |
|---|---|---|---|
| **SIGN** | **SCORE** | | |
| | 0 | 1 | 2 |
| Heart rate | Absent | Under 100/min | Over 100/min |
| Respiratory effort | Absent | Weak, irregular | Strong, regular |
| Muscle tone | Limp | Some flexion | Active movement |
| Response to stimuli | None | Weak movement | Cries |
| Colour | Blue or pale | Body pink, but extremities blue | Completely pink |
| **Total score** | 0/10 | 5/10 | 10/10 |

After five minutes, the Apgar scoring system is repeated, even if it was 10/10 at one minute and this helps to determine any immediate need for emergency care (Beisher, Mackey & Colditz, 1997:589). Sellers (2001a:824) maintains that the Apgar score obtained at one minute after birth is important with regard to the immediate situation and are an index of asphyxia and the need for intervention and resuscitation. The Apgar score obtained at five minutes after birth gives a good indication of the infant's response to resuscitative measures (Beisher *et al.*, 1997:590).

Neonatal resuscitation constitutes a series of actions that are taken so that normal respiration may be initiated and maintained within seven minutes. Failure to achieve this within seven minutes of birth will cause cerebral damage leading to cerebral palsy and sometimes death. It is mandatory for resuscitation to be carried out by two midwives and they must not be too proud to call for help. The staff working in the labour ward must be able to anticipate and recognize the need for resuscitation in the newborn (Sellers, 2001a:824). Mismanagement of labour and lack of delivery technique commonly lead to a low Apgar score of 7 or less at five minutes. The incidences of high or low statistics of babies born with low Apgar scores depend upon the competence of midwives in the management process prior to conception, during pregnancy, labour and neonatal care (Sellers, 2001a:502). Babies who fail to respond to resuscitation at birth have low Apgar scores of 6 or less at one minute and are sometimes referred to as being "flat" or "depressed" (Squire & Frances, 2004:4). An Apgar score of 8/10 usually indicates that the neonate is in good



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condition and that few or no problems may be expected (Nolte, 1998:2003).

Infants with mildly low Apgar scores, that is, of 6-8 at five minutes, will most likely be normal at follow-up. Those with moderate scores of 4-6 have a 20-50% chance of having a later handicap and those who score between 0-3 have a high mortality and if they survive they usually have a major handicap with or without mental retardation, motor dysfunction and cerebral palsy. A newborn that fails to achieve adequate cardiovascular respiratory function within one minute of birth is considered to have a low Apgar score (Kibel & Wagstaff, 1995:63).

Low Apgar scores are a universal problem. Various research studies have been carried out in order to find solutions to the factors that contribute to low Apgar scores among neonates. The outcomes or findings of the research studies done cite very little with regard to the competence of midwives in the prevention of low Apgar scores. The contributory factors were regarded as being either administrative, patient-related or medical personnel factors. Medical personnel included doctors and midwives who were lacking sufficient knowledge and skills needed for proper management of women during pregnancy and labour (MacDonald *et al.*, 2002:54). In supporting these, this research study is geared towards the competence of midwives with regard to the prevention of low Apgar scores among neonates.

According to the World Health Organization (2003), a midwife is responsible for clinical practice in midwifery discipline where she provides supervision, care and advice to the woman before conception, during pregnancy, labour and pueperium. She must be skilful enough to independently conduct deliveries and care for the newborn infant. A midwife must be able to give health education during antenatal clinic on topics such as the dangers of alcohol intake during pregnancy which may lead to a newborn born with a low Apgar score due to fetal alcohol syndrome (Viljoen, 1999:958). She detects any deviation or abnormal condition in the mother or the baby during pregnancy and labour and seeks medical assistance in case of any emergency, for example, if a midwife detects fetal distress, she seeks medical assistance in order to prevent low Apgar scores among neonates (Sellers, 2001a:xxxiii).



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The core competency of midwifery is the knowledge, skills, judgment and commitment to practice because it deals with the lives of two people and a single mistake can make the difference between a normal life and one burdened with disability, yet childbirth is more than the start of life (Sellers, 2001a:xxxiii). During antenatal clinic a midwife performs abdominal palpation to detect the height of the fundus of the uterus which helps with the detection of poor fetal growth. Poor fetal growth may be due to placental insufficiency which will later lead to a low Apgar score in a neonate. A midwife must be able to measure this by performing abdominal palpation using her own hands, a tape to measure symphysis fundal height and a disc which will indicate the gestational age and this must be done as a routine during antenatal clinic (Pereira & Odendaal, 1999:559).

A midwife must view pregnancy as a long-term process affecting not only the mother, but also the whole family as they both expect a normal, healthy baby with an Apgar score of 10/10 at one minute after birth (Sellers, 2001a:133). A midwife must be an expert in the estimation of gestational age and fetal weight. Clinical pelvimentry should be performed to assess the bony pelvis for the passage of the baby. The findings will provide direction for further management by the obstetrician in order to prevent complications which might lead to a low Apgar score. A midwife collects an accurate full history from the pregnant woman about her current pregnancy, previous medical illness, obstetric history and a follow-up visit will be given according to the gestational age of pregnancy (Richter, 2002:23).

A midwife provides high-quality care during antenatal clinic and basic skills such as abdominal inspection and palpation; screening and identification of high risk factors such as diabetes mellitus in pregnancy; monitoring of fetal and maternal condition; monitoring of contractions during labour; cutting and suturing in the process of an episiotomy; administration of drugs such as syntocinon, konakion and pethidine; performing internal vaginal examination and pelvic assessment; resuscitating asphyxiated newborn and conducting a clean and safe delivery (Fullerton, 2005:346). A midwife is expected to be competent in the manipulation and interpretation of the electronic fetal monitoring device for early detection of fetal distress which may result in a low Apgar scores (Zapta-Vázquez, Rodríguez-Carvajal, Sierra-Basto, Orji, Alonzo-vázquez & Echeverría-Equíluz, 2003:217).



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### 1.1.1 International perspectives regarding newborns born with low Apgar scores

A population-based study was conducted at Hammersmith, London in the United Kingdom from 1983-1987. A sample was composed of 570 infants weighing 2500 grams who had failed to establish regular respiration by one minute at birth and 250 of them required resuscitation. Results indicated that 0.1% neonates had an Apgar score of 0-3 at five minutes. Neonatal mortalities in this group were 95 (16.4%), infant mortalities were 104 (19.2%), 35 children died during childhood and cerebral palsy was diagnosed in 38 (6.8%). Neonates with Apgar scores of less than 7 at five minutes had symptoms of encephalopathy, for example seizures or twitching (Squire & Frances, 2004:4).

Squire and Frances (2004:1) further indicated that intrapartum asphyxia and chronic asphyxia were found to be contributory factors to low Apgar scores Though the study did not indicate the role of a midwife, it is expected that monitoring of the fetal condition by a midwife during labour is essential to ensure that delivery of the baby takes place before the occurrence of lack of oxygen supply to the fetal brain. Early detection of fetal distress through the aid of fetal scope or an electronic fetal monitoring device and the passage of meconium-stained liquor help a midwife to prevent intrapartum asphyxia and chronic asphyxia. An experienced midwife detects signs of fetal distress, identifies and grades meconium-stained liquor and seeks medical assistance for immediate management in order to prevent a low Apgar score (Myles *et al.*, 2004:548).

A research study was carried out in the United Kingdom at John Radcliff Hospital by the former Health Authority in 2002. The obstetrics records of 75 children with spastic cerebral palsy and 215 randomly selected controls born at 36 weeks or more of pregnancy were compared. Findings showed that there was an association between cord around the neck and cerebral palsy. Low Apgar scores of less than 5 at one minute (3%) and cord around the neck were considered as contributory factors to low Apgar scores (Greenwood, Impey & Sellers, 2002:36). During labour the role of the midwife is continuous monitoring of the fetal heart using the electronic fetal heart monitor or fetal scope in order to detect early signs of fetal distress. In places where an electronic fetal monitor is not available, a midwife must be able to hear and identify the rate and rhythm of the fetal heart using the fetal scope. The knowledge and experience of a midwife in the



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manipulation and interpretation of a cardiotocograph is very important in the identification of fetal distress which may result in a low Apgar score (Zapta-Vazquez *et al.*, 2003:3).

In the United States of America at Lucile Packard Children's hospital, medical charts of 206 children aged from 0-3 years from January 1993 to May 1997 were reviewed. Data regarding perinatal courses, birth history and maltreatment were collected and analyzed. Results showed that children in the early maternal inadequacy were those whose mothers had perinatal medical illness. They had significantly lower birth weight and higher neonatal morbidity as measured by the Apgar score at one minute and at five minutes. Statistics of low Apgar scores of less than 7 at one minute was 6.5% (14) and 8% (16) at five minutes and it was associated with maltreatment (Zelenko, Lock, Krammer & Steiner, 2000:8).

A midwife has an important role to play during antenatal clinic as a midwife is responsible for taking a full and relevant history of a pregnant woman which includes the current and previous pregnancies, medical conditions, heredity and genetic disorders, use of alcohol and tobacco, family and social circumstances and then performs a physical examination and abdominal palpation. A midwife is also responsible for home visits to assess the relationship between the mother and children in a family situation (Richter, 2002:19).

In order to prevent low Apgar score in the neonate during the second stage of labour, a midwife must be familiar with the average length of this stage of labour in order to prevent a delay in the delivery of the baby which may lead to low Apgar score. The average length in primigravida (woman giving birth for the first time) is 45 minutes and should not exceed one hour; and in multigravida (woman has previously given birth to a viable infant) it is 15-30 minutes and does not exceed half an hour (Sellers, 2001a:468).

A prolonged second stage of labour is associated with increased risk of fetal hypoxia and subsequent damage to the fetal brain or death. A clear protocol must be available and displayed so that correct action is taken immediately. A midwife with skills in the assessment of prolonged second stage of labour will be able to diagnose delay or prolonged second stage of labour and decide on the most suitable mode of delivery. It may either require obstetric forceps to aid the



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delivery of the baby or sometimes a caesarian section may be performed by the doctor (Bunchman, Pattison & Nyathikazi, 2002:900).

Obstetric forceps delivery is only performed by a skilled operator (doctor) or there must be adequate supervision during the procedure. It was first performed in England and later on in South Africa, though it is rarely done these days because of the complications it holds for a baby. If the doctor is not available, a midwife with an Advanced Diploma in midwifery who is experienced and competent may perform it. This procedure requires extra skill, judgment and experience to perform it and the role of a midwife is to assist the doctor during the procedure and to give moral support and encouragement to the woman throughout the procedure (Sellers, 2001b:1500).

In support of the above, a study was carried out to assess the effects of Kielland forceps rotational delivery as compared to caesarian section deliveries in the United States of America at the University of Connecticut Health Centre. Obstetric charts of 52 cases of Kielland forceps deliveries and 30 caesarian section deliveries were reviewed. The outcome of the study indicated that statistics of low Apgar scores were higher in babies delivered with the aid of midwifery forceps delivery than those delivered by caesarian section. The results were that 11.5% (6) of neonates delivered by Kielland forceps and 6.7% (4) of neonates delivered by caesarian section had Apgar scores of less than 7 at one minute after birth (Leo, Odobo, Ling, Rodis, Borgida & Campbell, 2000:1).

It is also of paramount importance for midwives to consider that short stature in the mother is thought to result in a moderate but significant increase in operative delivery (vacuum extraction, obstetric forceps delivery and caesarian section). Body height is an indication of pelvic adequacy. Small shoe size is also an indication of pelvic inadequacy. Midwives should assess and ensure that shoe size correlates significantly with height as this will help her to refer all women with shoe size equal to or less than 3 and a height of less than 1,3 meter (Bogaert, 2000:789).



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Another research study was carried out in Washington to evaluate the variables which predict neonatal depression in vaginal delivery of 89 neonates. The results of the study revealed that nine babies had an Apgar score of less than 7 at five minutes and 80 babies had an Apgar score of above 7 at five minutes. Head to body delivery interval was available for five cases and they were due to difficult delivery in cases of shoulder dystocia maneuvers. A midwife requires technical skill to perform abdominal palpation to assess the fetal weight before delivery and she must be experienced in the delivery of big babies. Early diagnosis of delay in the first stage of labour will help a midwife to refer or report the woman for further management (Sellers, 2001a:469).

During antenatal clinic, high-risk clients with pregnancy-induced hypertension (PIH), ante-partum haemorrhage, heart disease and diabetes mellitus are monitored and referred to a medical practitioner by the midwife for further management in order to prevent low Apgar scores. Women with these conditions are preferably cared for in Level II and Level III hospitals which are well staffed with medical obstetricians at their antenatal clinic (Moodley, 2000:362). A midwife must be competent enough to cope proficiently with such cases. Mechanical equipment such as a data scope for monitoring the blood pressure level and a glucometer for monitoring the blood sugar level extends the midwife's power of observation and thereby improves the physical and mental quality of fetal and neonatal life (Myles *et al.*, 2004:5). It is the responsibility of midwives to ensure that all these necessary and important items of equipment are always available and in good working condition. The United Kingdom Council requires that midwives practice teaching expectant mothers or pregnant women health education subjects during antenatal clinic such as the causes and treatment of minor disorders during pregnancy for example heartburn, constipation and morning sickness; the importance of exercise during pregnancy and preparation for labour (Myles *et al.*, 2004:4).

At Chandigarh in India a research study was done in 1998 where 222 neonates with Apgar scores of less than 7 were recruited in order to identify the obstetric causes of a low Apgar score at one minute. Results showed that 64% had an Apgar score of 4-6 at one minute, 36% had an Apgar score of less than 4 at one minute and 84% of cases improved to 7 or above 7 at five minutes. Antepartum haemorrhage and PIH accounted for about 50% of the causes of low Apgar scores



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(Jain, Bagga, Gopalan & Naranga, 2005:36). In the case of antepartum haemorrhage, a midwife shall not carry out internal examination to prevent aggravating the condition and refer the woman to the medical practitioner for emergency management. A midwife is responsible for continuous monitoring of fetal and maternal conditions every five to 15 minutes, depending on the severity of bleeding, recording and reporting three-hourly pad checking (Myles *et al.*, 2004:230).

A study was conducted in order to review the signs of asphyxia in 151 neonates at the Virgen Del Consuelo Hospital in the United Kingdom. Babies born with asphyxia neonatarum were selected as the sample for the study and 106 had met the requirements of the study by 2002 (Vento, Asensi, Sanstre, Garciasala & Vina, 2003:241). The outcome of the study showed low Apgar scores at one minute and at five minutes in the asphyxiated babies due to meconium aspiration and fetal hypoxia. Results are presented in **Table 1.2** below.

**Table 1.2 Statistics of low Apgar scores in asphyxiated babies obtained from Vento *et al.* (2003:242)**

| Time | Apgar score | Number of neonates |
|---|---|---|
| 1 minute | 1-4 | 3 |
| 5 minutes | 5-8 | 6 |
| 10 minutes | 7-8 | 8 |

An observant and well-trained midwife develops the ability to recognise early signs of fetal distress during the first stage of labour, detect and grade signs of meconium-stained liquor and commence immediate intervention (Sellers, 2001b:814).

A study was carried out and supported by grants at Haukeland University Hospital, Bergen, Norway. A total of 370 women with single pregnancy were recruited at a low-risk antenatal clinic for larger evaluation of fetal venous hemodynamics (Skulstad, Rasmussen, Seglem, Raginhild, Svanaes Aareskjold & Kiserud, 2005:13). Eleven cases that delivered before 37 weeks were excluded from the study and 359 were left for the study. The mode of delivery was by caesarian section in 25 cases and by forceps delivery in 19 cases due to fetal distress (Skulstad *et al.*, 2005:4).



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Results of the study indicated that 23 babies had an Apgar score of less than 7 at one minute and three of them had an Apgar score of less than 7 at five minutes. An Apgar score of less than 7 at one minute was related to reduction in the uterine blood flow because of vasoconstriction in antepartum haemorrhage. One neonate had signs of brain damage such as seizures and later developed cerebral palsy (Skulstad *et al.*, 2005:5).

In order to prevent low Apgar scores among neonates, the role of a midwife during the first stage of labour is to constantly monitor maternal and fetal conditions. Fetal heart rate and rhythm should be monitored before, during and after the contractions in order to detect the first signs of early and late deceleration of the fetal heart as this will first show when the fetus is stressed during contraction of the uterus. A midwife must be competent enough to interpret the findings from the electronic fetal heart monitor and report to the doctor in case of fetal distress (Sellers, 2001a:367).

### 1.1.2 Sub-Saharan perspectives regarding newborns born with low Apgar scores

A midwife functions as an independent practitioner and is responsible for the management and resuscitation of meconium aspiration in asphyxiated neonates (Myles *et al.*, 2004:5). Research studies done in the African countries indicate that there are neonatal cases born with low Apgar scores. The attitude and the experience of midwives in charge affect the progress of labour (Wolf, 1997:4).

According to the study carried out at Harare university hospital, a low Apgar score is defined as an Apgar score of 5 or less at 5 minutes. Statistics about low Apgar scores was 15 per 1000 live births and research studies revealed that babies with an Apgar score of 5 or less at 5 minutes constituted a mortality rate of 42% and those with an Apgar score of less than 3 at 5 minutes constituted mortality rate of 77% and this was due to the absence of sufficient resuscitation and follow-up by midwives (Wolf, 1997:1).



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In Mpilo Central Hospital, a tertiary referral hospital in Bulawayo, Zimbabwe, a research study of a total of 10508 deliveries was carried out and the research results indicated that neonatal birth asphyxia, antepartum intervention by the administration of drugs like pethidine four hours before delivery, congenital abnormalities and premature deliveries were the contributory factors to low Apgar scores. Statistics of low Apgar scores in term babies were 19 per 1000 live births. 3753 babies were admitted to the Special Baby Care Unit and of them, 370 were born with Apgar scores of 5 or less at five minutes, of which 164 (44%) died in the neonatal period while 206 survived and were carefully monitored during infancy and childhood (Wolf, 1997:1). A midwife is authorized to acquire, keep and administer pethidine hydrochloride under certain conditions. The role of a midwife is to evaluate carefully the progress of labour through the monitoring of maternal and fetal condition, monitoring of uterine contractions using a combination of both abdominal palpation and uterine cardiotocodynamomentry (electric device for recording fetal heart; strength, duration and frequency of uterine contractions) and assess the rate of cervical dilatation. The primary outcome is initiation of labour and delivery within 24 hours (Moodley, Venkatachalam & Songca, 2003:371).

Severe pain in labour is the main indication for administration of pethidine and it should not be given after 6 cm dilatation in primigravida and after 4 cm dilatation in multigravida in order to prevent the danger of its depressing the respiratory centre and causing a low Apgar score in the neonate (Keskin & Keskin, Avsar, Tabuk & Caglar, 2003:3). A midwife must assess and identify the cervical dilatation and report the woman to the doctor in case of severe and unbearable pain. However she may administer an intramuscular injection of pethidine (50mg-100mg) to the patient as prescribed by the attending obstetrician (Sellers, 2001b:451).

During antenatal clinic, the role of the midwife is screening the pregnant women to identify patients at risk of conditions such as premature labour, premature rupture of membranes and refer them for medical investigation and proper management, as these are some of the factors that contribute to low Apgar scores among neonates. She is responsible for giving health education to pregnant mothers about the importance of rest and sleep, avoidance of strenuous exercises which may stimulate premature labour or premature rupture of membranes and lead to



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low Apgar scores (Sellers, 2001b:1258).

### 1.1.3 South African perspectives regarding newborns born with low Apgar scores

The South African Nursing Council is the body that regulates the practice of nurses by promulgating the regulation relating to the conditions under which midwives and enrolled midwives may carry on their profession (Regulation R2488 of 26 October 1990) and the regulation relating to the scope of practice of registered nurses (Regulation R2598 of 30 November 1984) as amended (Searle, 1987a:178).

A midwife ensures that all materials and equipment for midwifery practice are available and in good working condition. A midwife keeps clear and accurate records of the progress of pregnancy; labour in the first, second, third stage, including the fourth stage and puerperium; provides antenatal services and applies the basic skills and techniques such as internal examination and pelvic assessment, and cutting and suturing for an episiotomy in the second stage of labour. A midwife's knowledge and experience will help her to detect abnormalities such as fetal distress, cord prolapse which may lead to a low Apgar score, and refer the patient to the medical practitioner for emergency action (Searle, 1987a:189).

The South African Nursing Council regulation which governs the practice of a midwife (R2488) states that in case of antepartum haemorrhage, a midwife shall not carry out an internal examination to avoid aggravating the condition and refer the woman to the medical practitioner for emergency management (SANC, 1990:2). Maternity Guidelines of South Africa states that the partogram must be promoted as the only legitimate record of labour progress to the extent that failure to use a partogram would be seen as negligence or indefensible in a medico-legal context. The partogram contains all information about the maternal and fetal condition of the woman during the process of labour until delivery. It must be used for every pregnant woman and problems detected on the partogram must be managed accordingly. During the training of student midwives and the re-training of midwives the central position of the use of the partogram for every woman in labour must be emphasised (Moodley, 2000:363).



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When the second stage of labour is imminent the midwife shall stay with the patient until after the birth of the baby and thereafter as long as the condition of mother or child demands (SANC, R2488, 1990:2). According to the scope of practice of the registered nurse R2598 of 1984 as amended, a midwife must provide effective advocacy for the patient to obtain the health care needed for a healthy normal baby (Searle, 1990:188).

According to the Maternity Guidelines of South Africa, one of the pillars of safe motherhood is the choice of contraception. Prior to conception a midwife is responsible for conveying information about family planning to individuals and couples in order for them to plan the timing, number and spacing of pregnancies (Godi, Mhlanga, Saloojee, Steinberg & Tlebere, 2002:5). Following conception, a midwife encourages the pregnant woman to book for antenatal care as soon as the pregnancy is 4-5 weeks duration for the purpose of antenatal preparation for the best possible outcome for both the woman and the baby. A midwife does screening, assesses and identifies high-risk conditions such as pregnancy-induced hypertension, treats and refers for medical assistance, gives health education about labour so that the woman will be able to cope and co-operate during labour (Godi *et al.*, 2002:18).

In South Africa, the Perinatal Problem Identification Programme (PPIP) was developed by the Medical Research Council Unit for Maternal and Infant Health Care Strategies and has been extensively field-tested since 1990 (Bunchman *et al.*, 2002:897).

The Perinatal Problem Identification Programme is a simple, user-friendly computer-based programme which calculates various perinatal indices and describes the medical conditions that lead to perinatal death. Contributory factors can be patient related, medical personnel, specifically midwife related, insufficient notes and administrative problems (Pattison, De Jonge, Pistorius, Howarth, De Wet, Bremer, Hy & Delport, 2003:158). Roz Prinsloo of The Department of Health at National level coordinated the Perinatal Problem Identification Programme and organized the first Perinatal care survey workshop which was held at Hammanskraal campus of the University of Pretoria in November 2000.



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The workshop brought together members of the Medical Research Council Unit, representatives and delegates from the nine provinces constituted by Department of Health doctors and midwives as the Perinatal Problem Identification Programme users (Pattison *et al.*, 2000:1). The aim of the workshop was to collate data relating to perinatal care from throughout South Africa and to identify major areas of concern regarding the care of women during the pregnancy, labour and newborn period. Since then, a perinatal survey is carried out annually and statistics are compiled (Pattisson *et al.*, 2003: VI). International perinatal programme sites have registered with the South African PPIP and these include Lamb Hospital (Bangladesh), Oshakati State Hospital (Namibia) and Mulago Hospital (Uganda). Birth asphyxia related to low Apgar scores accounts for about 19% of approximately 5 million deaths that occur each year world wide (MacDonald *et al.*, 2003:167).

Perinatal Problem Identification Programme data were obtained from 27 state hospitals in South Africa where 123 508 births in hospitals were surveyed with 4 142 perinatal deaths of neonates. The reason for the study was to identify the primary causes of obstetric deaths resulting from intrapartum-related birth asphyxia. The results indicated Apgar scores of less than 7 at one minute among the neonates delivered and the statistics are as follows: 4.8/1000 live births were due to intrapartum-related birth asphyxia, 36,6% were due to delay on the part of mothers in seeking attention during labour. In 25% there were signs of fetal distress that were interpreted incorrectly by midwives, 185 were due to inadequate fetal monitoring by midwives and in 7% there was no response to poor progress in labour by midwives (Bunchman *et al.*, 2002:397). Though the study did not indicate the role of midwives, it clearly interpreted the need for a competent midwife with regard to the prevention of low Apgar scores among neonates.

Research study was carried out at Umtata General Hospital in the Eastern Cape where 10 507 single infants were delivered of whom 360 were macrosomic. Macrosomia is a large or overweight baby. The purpose of the study was to identify the effects of risk factors such as diabetes mellitus in the physical condition of a neonate associated with macrosomia. In this study 348 babies represented the sample and an equal number of babies delivered weighing 3-3.2 kilograms were selected as the control group. At the end of the study, results showed an increased number of babies born with low Apgar scores among the macrosomic babies. Results



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showed that 18 (5.2%) of the macrosomic babies had an Apgar score of less than 7 at one minute, while 16 (4.6%) of the babies from the control group had an Apgar score of less than 7 at one minute. This indicated that low Apgar scores are associated with large or overweight babies (Essel & Opai-Tetteh, 1995:43).

The role of the midwife during antenatal clinic is to encourage early antenatal care at eight weeks and to be aware of the predisposing factors of fetal macrosomia like excessive increase in weight gain during pregnancy, history of giving birth to a macrosomic infant, post-term pregnancy and gestational diabetes mellitus (that which occurs only during pregnancy) because these were found to be the significant risk factors. The incidence of macrosomia generally increases with parity and is more obvious in grandemultiparous cases. A midwife must have the ability to estimate fetal weight through abdominal inspection and palpation to identify macrosomic infants (Essel *et al.*, 1995:45).

Another research study was carried out at Tygerberg Hospital, University of Stellenbosch in South Africa where 100 women in early spontaneous labour were nominated (Howarth, 1995:249). The aim of the study was to evaluate the value of early intrapartum umbilical artery Doppler velocimetry in the prediction of fetal comprise. Of the 100 cases, 12 were delivered by caesarian section due to fetal distress, five by forceps delivery and three by vacuum extraction. Results showed that six babies were delivered with Apgar scores of less than 7 at five minutes due to a reduction in the uterine blood flow attributed to severe hypertension and antepartum haemorrhage (Howarth, 1995:249). This contributes to 20% or more of all neonatal deaths in most Southern African public sector hospitals (Kibel & Wagstaff, 1995:61).

In addition, figures from developed countries indicate that less than 10% of the children with cerebral palsy are the result of birth asphyxia with low Apgar scores and local studies suggest that this number may increase by five or more. Therefore midwives who are involved in the delivery of newborn infants need to be trained adequately in the diagnosis, management of labour and resuscitation of asphyxiated babies (Gregersen, Ballot, Guidozzi & Cooper, 1999:61).



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### 1.1.4 Provincial perspectives regarding newborns born with low Apgar scores

According to the survey carried out of the nine provinces of South Africa since 1999-2003, there were 462 348 deliveries, and 12 773 deaths identified of which 4 502 occurred during the neonatal period. Neonatal deaths were 32% of 1 459 and were identified to be related to low Apgar scores. Limpopo Province has 43 hospitals of which 38 are currently Perinatal Problem Identification Programme users. Statistics of deaths revealed that low Apgar scores were the primary factor (MacDonald *et al.*, 2003:139).

Limpopo Province is divided into seven districts (level II) which are further subdivided into 35 (level I) and one level III hospital in the Polokwane-Mankweng complex. Tshilidzini hospital is one of the level II hospitals and it falls under the Vhembe region (Pattison *et al.*, 2003:137). Seven hospitals fall under Vhembe district and they are Tshilidzini; Siloam; Donald Fraser; Malamulele; Louis Trichardt; Messina and Elim Hospital. Hayani Hospital is an additional one, but it is for maximum security psychiatric and state patients only and was therefore not included in this study. Tshilidzini had the highest number of deliveries, 9 348, for the survey reported from January 2002 to December.2003, followed by Malamulele with 5 902, Elim Hospital with 5 859, Siloam with 4 407, Donald Fraser with 4 322, Messina with 1 991 and the least was Louis Trichardt Hospital with 1 771 (MacDonald *et al.*, 2003:141). Three hospitals were selected and for the purpose of this study they were named Hospital A, Hospital B and Hospital C. Statistics from three selected hospitals, Hospital A, Hospital B and Hospital C, in the Vhembe district show that low Apgar scores among neonates is still a problem that needs to be prevented, taking into consideration the competence of midwives with regard to its prevention (MacDonald *et al.*, 2003:141). **Table 1.3** on the following page (17) presents statistics of low Apgar scores from the three hospitals mentioned.



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**Table 1.3 Hospital A, Hospital B and Hospital C Maternity statistics on low Apgar scores January – June 2005**

| Month | Hospital | Deliveries | Low Apgar score |
|---|---|---|---|
| January | Hospital A | 438 | 23 |
| | Hospital B | 277 | 5 |
| | Hospital C | 215 | 8 |
| February | Hospital A | 366 | 17 |
| | Hospital B | 278 | 8 |
| | Hospital C | 184 | 10 |
| March | Hospital A | 468 | 21 |
| | Hospital B | 291 | 11 |
| | Hospital C | 220 | 9 |
| April | Hospital A | 461 | 19 |
| | Hospital B | 294 | 14 |
| | Hospital C | 240 | 16 |
| May | Hospital A | 464 | 20 |
| | Hospital B | 278 | 10 |
| | Hospital C | 215 | 10 |
| June | Hospital A | 460 | 18 |
| | Hospital B | 295 | 11 |
| | Hospital C | 225 | 8 |

The above table confirms the fact that the statistics of low Apgar scores among neonates is not coming down and the question lies with the competence of midwives with regard to the prevention of low Apgar scores among neonates.

The problem of low Apgar scores needs to be researched in order to find solutions to it as it may create an impact on the midwives who are responsible for maternal and child care services, parents of babies with low Apgar scores, the community and the state Department of Health concerned. Midwives who lack sufficient skills and ability may require re-training and



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development. The morale of the mothers of babies with low Apgar scores may be affected and lowered because of the unplanned prolonged hospitalization. The community may also have an increased number of mentally handicapped children and it may also create a financial burden on the Department of Health and Social Development which may have to grant permanent disability grants for mentally handicapped children. This research study focused on identifying and describing the competence of midwives with regard to the prevention of low Apgar scores among neonates. Furthermore, an analysis of maternity case records for women who delivered infants with low Apgar scores was carried out.

## 1.2 THE PROBLEM STATEMENT

The practice of obstetric nursing requires a midwife practitioner who is competent to practice independently in providing antenatal services during pregnancy, progress of labour and conducts delivery on her own for a normal healthy baby. Vhembe district statistics from three particular hospitals, that is Hospital A, Hospital B and Hospital C revealed that out of 1 218 deliveries in a month, 43 neonates were born with low Apgar scores. Contributory factors might be many and varied (MacDonald *et al.*, 2003:142).

## 1.3 PURPOSE OF THE RESEARCH

The purpose of the study was to assess the competence of midwives with regard to the prevention of low Apgar scores among neonates. The Maternity Guidelines of South Africa (Godi *et al.*, 2002/2007) and the South African Nursing Council Regulation (R2488) serve as conceptual framework for the study. Furthermore, the study attempts to develop guidelines with regard to improving the competence of midwives regarding the prevention of low Apgar scores among neonates.



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## 1.4 OBJECTIVES OF THE STUDY

- To determine the competence of midwives with regard to the prevention of low Apgar scores.
- To describe the knowledge of midwives regarding the prevention of low Apgar scores among neonates.
- To determine the opinions of midwives regarding the prevention of low Apgar scores among neonates.
- To develop guidelines to improving the competence of midwives regarding the prevention of low Apgar scores among neonates.

## 1.5 SIGNIFICANCE OF THE STUDY

The findings of the study may add value in the following areas:

- Recommendations will help the health service managers in the development of protocols for the management of conditions contributing to low Apgar scores among neonates.
- All midwives and doctors need to be trained in the implementation of these protocols. It is assumed that Guidelines for Maternity Care in South Africa will be implemented throughout South Africa.
- Recommendations will conscientise health service managers to develop new skills and re-skill midwives for the management of midwifery care in the different areas and levels of services and the health system as a whole. This will be achieved through in-service training which may be conducted on a quarterly basis, by the attendance of midwifery seminars, symposiums and midwifery conferences. A comprehensive system of continuing education and review of the skills and competence of midwives would ensure that the standard of total health care provided would be raised.
- Curriculum developers will be informed to strengthen aspects which show a deficit in the training of student midwives. Maternity guidelines should evolve in response to challenges, as maternal health care requires urgent attention to prevent poor maternal and neonatal outcomes. Midwives should provide appropriate essential and emergency



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midwifery care. The SANC regulation R2488 stipulates the conditions under which midwives may execute midwifery care to pregnant women during the antenatal period, labour and pueperium. Effective integrated academic development programmes are to be established to strengthen the capacity of all students entering health institutions.

- The findings of the study may be translated into the development of programmes for use during the mentoring of newly-qualified midwives when they are allocated to maternity units. The goal of the teaching and learning process is the acquisition of a fundamental core knowledge, demonstration of critical thinking ability and demonstration of competency in the performance of clinical skills, saving women's and neonate's lives with cost and quality effective midwifery care based on sound ongoing education to newly-qualified midwives.

## 1.6 DEFINITION OF TERMS.

### 1.6.1 Apgar score

Apgar score is the method of assessing and documenting the infant's physical condition in terms of 10/10 after birth within one minute and is repeated after five minutes (Sellers, 2001a:500). In this study it shall mean physical examination or assessment of the condition of a newborn baby immediately after birth in terms of 10/10 score, within one minute.

### 1.6.2 Low Apgar score

Low Apgar score is defined as an Apgar score of 4-6 or less at five minutes (Wolf, 1997:1). In this study it shall mean an Apgar score of less than 7/10 at five minutes and needs immediate attention.

### 1.6.3 Neonate

A neonate is an infant from birth through the first 28 days of life (May & Mahlmester, 1990: 1211). In this study a neonate shall mean a newborn baby who has just been delivered until the



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period of 7 days.

### 1.6.4 Midwife

A midwife is a person who, having been legally admitted to a midwifery educational programme duly recognized in the country in which it is located, has successfully completed the course of studies in midwifery and has acquired the requisite qualification to be registered and /or legally licensed to practice midwifery (Myles *et al.*, 2004:5). In this study it shall mean a midwife registered with the South African Nursing Council and responsible for maternal and child care services from conception, during pregnancy, labour and the post-partum period, and conducting deliveries on her own responsibility.

### 1.6.5 Labour

Labour is a process whereby a viable fetus and the placenta and membranes are expelled from the uterus (Sellers, 2001a:327). In this study labour means the process of giving birth to a baby.

### 1.6.6 Competence

Competence is the ability of the midwife to function completely and proficiently on their own through knowledge and skills acquired throughout their training (Myles *et al.*, 2004:4). In this study it shall mean the ability to practice with confidence, skill, knowledge and judgment with regard to the prevention of low Apgar scores among neonates.

### 1.6.7 Maternity

Maternity is a specialised unit where pregnant women undergo specific maternal services that include family planning, antenatal clinic, labour (progress of labour and delivery), pueperium and neonatal care (Sellers, 2001a:138). In this study maternity means a unit where women give birth to babies.



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## 1.7 RESEARCH DESIGN AND METHODS

It was important to make a choice of the study design because it organises all components of the study in such a way that it is likely to lead to valid answers to the questions posed. The study followed a quantitative descriptive design. This approach was chosen because it uses structured procedures and a formal instrument to collect numerical information under controlled conditions, and it deals with quantities and relationship between variables. In this study, structured questions were formulated to assess and describe the competencies of midwives with regard to the prevention of low Apgar scores among neonates.

The population in this study was all midwives practising in the maternity units of three particular hospitals of the Vhembe district. For the purpose of this study a non-probability purposive sampling approach was used.

The purposive sampling method was used to select the hospital sample. A busy hospital with more deliveries per month was selected. Hospital A, Hospital B and Hospital C were selected because the three hospitals met the criteria. Purposive sampling was used because the researcher used her own knowledge about the population and its elements to handpick cases to be included in the study. All available midwives practising in the maternity departments who were judged to be typical of the population in question or particularly knowledgeable about the issue of the prevention of low Apgar scores among neonates from three hospitals were chosen. This meant that not all midwives working at Hospital A, Hospital B and Hospital C would have a chance to be part of the study, but only midwives who were allocated to and practising in the maternity units would be included in the study and they would be required to have at least one year's experience of practising in maternity, and six months in the labour ward. A sample size of 100 midwives was sufficient to achieve saturation of the theoretical categories.

A self-report using a structured questionnaire was used as the method of data collection because the research focused on the assessment of the competence of midwives with regard to the prevention of low Apgar scores among neonates. Self-reports are often collected by means of a formal written document referred to as an instrument. A self-administered questionnaire with



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closed-ended and open-ended questions was formulated. Questions with relevant content areas for assessing the competence of midwives with regard to the prevention of low Apgar scores among neonates were drafted. Questionnaires were distributed to all midwives practising in the maternity units of three different hospitals and they were allowed to complete them in the presence of the researcher and bring them back.

The questionnaire was used as an instrument for collecting self-reported data from the respondents. The questionnaire was formulated and designed, keeping in mind the objectives of the study. Closed and open-ended questions were formulated and the questionnaire was distributed to the midwives because the researcher was interested in assessing the competence of midwives with regard to the prevention of low Apgar scores among neonates. A checklist comprised of skills/competencies expected of midwives was developed. Midwives were expected to tick the appropriate responses, either competent/incompetent in one section, strongly agree/agree/strongly disagree/disagree in another section, and they were requested to answer a few open-ended questions.

Data obtained from the completed questionnaires were subjected to analysis by the Statistical Packages of social sciences (SPSS) programme to establish frequencies and percentages. The purpose of the data analysis was to impose some order on a large body of knowledge so that a general conclusion could be communicated in a research report. Statistical procedures enabled the researcher to reduce summaries, organize, evaluate, interpret and communicate numerical information.

Ethics is doing what is right and good during research and all ethical principles to be applied to the research process were observed. The researcher protected the rights of the midwives and those of the institutions in which the study was conducted. According to Seaman (1987:22-26), midwives have several rights such as the right not to be harmed, the right to maintain self-respect, dignity and the right to privacy, informed voluntary consent, confidentiality and anonymity, and the right to refuse to participate or to withdraw from participation without any fear of discrimination.



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## 1.8 LIMITATIONS OF THE STUDY

- Research was conducted at Hospital A, Hospital B and Hospital C in the Vhembe district in Limpopo Province. The study can therefore not be generalized to the entire Vhembe district and Limpopo Province.
- The hospitals were purposively selected for the research study for logistic purposes. Therefore only midwives who were working in maternity units comprised the sample of the study.
- The type of setting in which the study was conducted constituted a limitation because the midwives were on duty. They found it difficult to relax completely in a working environment, and it took time for some of them to complete the questionnaire. The researcher was patient and calm until the questionnaires were completed.
- The population size in other hospitals was too small to warrant comparison. However, the study itself was not intended to compare hospitals and therefore the interpretation of the findings has equal implications for each of the three hospitals used for this study.
- Much of the time scheduled for collecting data was spent on efforts to obtain the required provincial permission and at different hospitals to conduct the study; to such an extent that verbal permission was given by some of the hospitals managers prior to a written permission.

## 1.9 CONCLUSION

Chapter 1 discussed the introduction to and background of the study, the problem statement, purpose of the research, objectives of the study, significance of the study, definition of terms, research design and methods, limitations of the study, conclusions and overview of the subsequent chapters. A low Apgar score may have a negative impact on the baby's life and health, parents and the community. It may also lower the morale of midwives and this lowering of morale can affect negatively the quality of midwifery care. This may create a vicious circle of babies born with low Apgar scores. This problem therefore needs a solution. Babies are the nation of tomorrow, reconstruction and development of South African country. Chapter 2 addresses the literature review.



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## .1.10 OVERVIEW OF THE SUBSEQUENT CHAPTERS

This chapter covered the phenomenon of the Apgar score, the history of midwifery, the conceptual framework based on the Guidelines for Maternity Care in South Africa and legislation regulating the practice of midwives (R2488), the outcomes of research on low Apgar scores, research outcomes on the competence of midwives and the conclusion. Chapter 2 covers a discussion of the literature that has been reviewed to support the competence of midwives regarding the prevention of low Apgar scores among neonates.

Chapter 3 incorporates a description of the research methodology, research design, population, sampling, methods of data collection, the validity and reliability of the research instrument and ethical considerations pertaining to this research project.

Chapter 4 comprises an analysis of the data collected using a structured questionnaire from midwives who were practicing in the maternity units of the three selected hospitals in the Vhembe district of Limpopo Province. Section A covers the demographic profile of the midwives who participated in the study. Section B covers midwifery skills that the midwives need to be determined competent, section C covers the midwives' knowledge of midwifery skills and section D covers the opinions of midwives regarding the prevention of low Apgar scores among neonates. Maternity case records of 30 babies born with low Apgar scores were analysed.

Chapter 5 comprises a discussion of the research results and conceptualisation of the literature. This chapter covers identified incompetence as perceived by midwives, identified lack of knowledge as perceived by midwives and discussion of the findings from maternity case records of babies born with low Apgar scores.

Chapter 6 provides the conclusions and recommendations of the study. A brief summary of the conclusion and findings is discussed including recommendations relevant to midwifery practice, nursing management and nursing education. Recommendations for future research are indicated.



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# CHAPTER 2

# LITERATURE REVIEW

## 2.1 INTRODUCTION

Literature review is a critical summary of activities involved in searching for the research topic under study and developing a comprehensive knowledge of that specific topic (Polit & Hungler, 1995:645). The purpose of a literature review is to acquire the knowledge which will form a broad background of the available and related information to the study being conducted (Burns & Grove, 2003:55). It helped the researcher to identify the gaps and weaknesses in the previous studies to enable her to justify new investigations. It also helped the researcher to become aware of what had already been done, including the latest developments in the subject under study (Basson & Uys, 1998:17). The work of other researchers would form a background that the researcher would build upon (Polit & Hungler, 1999:91).

The researcher conducted the literature review by consulting books, journals, the internet and articles. Findings from previous research studies helped the researcher in the studies with regard to the problem statement, design and data analysis process. It also provided a basis of comparison when interpreting the findings. The literature review covered the following topics:

- The phenomenon of the Apgar score
- The history of midwifery
- Legislation related to midwifery practice in South Africa
- Maternity guidelines in South Africa
- Research outcomes on low Apgar scores
- Research outcomes on the competence of midwives.



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## 2.2 THE PHENOMENON OF THE APGAR SCORE

The Apgar score is the method of evaluating and documenting/recording the physical condition of the baby in terms of 10/10 immediately after birth at one minute and it may be repeated at five minutes (Myles, Fraser & Cooper, 2004:351). An Apgar score of 10/10 is expected for a healthy-active neonate. The interpretation of the Apgar score indicates whether the newborn infant is able to initiate and maintain respiration normally. It is intended to assess the condition of the newborn baby for the necessity of immediate intervention and resuscitation by the midwife (Sellers, 2001a:824).

The method was introduced by an American anaesthetist called Virginia Apgar in 1953. According to Virginia Apgar, a score at one minute indicates whether the newborn infant requires immediate resuscitation and a paediatrician (a doctor who specialises in the treatment of children) is notified if the Apgar score is 5 or lower than 5 at one minute. The score at five minutes gives a more accurate prediction regarding the survival of the infant and the paediatrician is notified if the score is 6 or lower than 6 at five minutes (Sellers, 2001b:500).

Physical assessment is done under five vital points and in numerical terms. Each vital point is given a score of 0, 1 or 2 depending on the findings following an assessment of the physical condition of the neonate after birth. A total score of 10/10 is given derived from the summation of the five vital signs presented below.

- **Colour**

  The body is assessed for skin colour. If the body is completely pink a score of 2 is given, if the body is pink and the hands and feet are blue or pale a score of 1 is given and lastly, if the whole body is blue or pale (implying lack of oxygen supply) a score of 0 is given (Sellers, 2001a:502).

- **Respiratory effort**

  For initiation of regular normal respiration of about 40 per minute with strong cry, a score of 2 is given. If the respiration is irregular, slow and with weak cry, a score of 1



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is given. Lastly, if there is no sign of respiration at all a score of 0 is given (Sellers, 2001a:502).

- **Heart rate**

  If the pulse/heart rate is 100 beats per minute and above, a score of 2 is given. Where the heartbeat is less than 100 beats per minute and is slow, a score of 1 is given. Lastly a score of 0 is given in a case where there is no heartbeat at all (Beischer *et al.*, 1997:588).

- **Muscle tone**

  A score of 2 is given if the infant has active movement of the whole body and both limbs. If the infant has some flexion movements of limbs a score of 1 is given. Lastly, if there is no flexion movement or the infant is limp a score of 0 is given (Beischer *et al.*, 1997:588).

- **Response to stimuli**

  When the infant is stimulated by flicking the foot or fingers the infant cries strongly and a score of 2 is given. If the infant is stimulated either on the toes or fingers and responds by some facial grimace, a score of 1 is given. For failure of the infant to respond to any stimulus a score of 0 is given (Beischer *et al.*, 1997:588).

## 2.3 THE HISTORY OF MIDWIFERY

### 2.3.1 Early and later development

The practice of assisting a woman in childbirth is one of the oldest forms of health care, although childbirth is a natural process. In primitive societies, a multiplicity of gods and goddesses were thought to be concerned with conception/fertility and childbirth. In Egypt, Ishtar and in India Dhatr were the gods responsible for child-bearing (Mellish, 1996:41).



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They used to perform certain tests to determine the presence of pregnancy and fetal sex. A married woman was instructed to use her urine to water wheat and barley. If both plants grew rapidly they confirmed that the woman was pregnant .In the case where the barley grew faster than the wheat they got confirmation that the sex of the baby was female and vice versa (Olds, London, Ladewigt & Davidson, 1990:15). Modern confirmation is based on the use of ultrasound and other investigations such as urine and blood for pregnancy tests (Olds *et al.*, 1990:4).

Midwifery was the most basic of all health care activities during the primitive days. During the birth of the baby, someone severed the umbilical cord of the baby and it is not known whether there was a tool involved in doing that or whether it was bitten. The placenta was removed and the infant placed in the mother's arm for warmth and it was put to the breast for nourishment. Those were instinctive actions as witnessed in animal birth. The primitive mother was recognized as the world's first nurse and midwife (Searle, 1987b:3).

In some societies a woman in labour had to be left alone to assist herself in the delivery process, but in other societies wise women who had given birth were allowed to assist the mother in the delivery process because of their experience. During labour, techniques for stimulating the baby from the mother in labour were used as a means of facilitating labour and delivery. Women who helped the mother in the delivery process were called the midwives (Mellish, 1996:41).

All the books of the Old Testament, from Genesis to Malachi, refer to the medical care of a pregnant woman and her baby by women who had been taught by women of their own country and those who had studied in Egypt (Olds *et al.*, 1990:13). Midwives are mentioned in the Bible in the book of Exodus 1:15 where two Hebrew midwives called Sifira and Phua were responsible for assisting the women during the child-bearing process. The two midwives ensured that the mother gave birth to a healthy normal baby despite the instructions from King Pharaoh to kill all male infants after delivery. God dealt well with midwives and people multiplied and waxed mightily, meaning that healthy babies were born with Apgar scores of 10/10 at one or five minutes after birth. Birth stools or obstetric chairs were used for child-bearing (Mellish, 1996:41). See picture for **Reproduction of a sixteenth-century woodcut illustrating a birth stool (chair) in use** from Culver Pictures in New York.



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**Figure 1 (adopted from Olds *et al.*, 1990:13)**

Midwives were responsible for the child-bearing process, and the monitoring of women during labour up to childbirth. In the case where there was prolonged labour or difficult delivery, a consultant had to be called in and the aid of the gods had to be summoned for both midwife and patient so that labour could be facilitated and child be born. In case of severe, unbearable labour pains, they performed their rituals to alleviate labour pains, although it was not indicated how they performed them (Searle, 1987a:11).

Magical incantations were performed to induce labour in case of post dates so that delivery would take place before ossification of sutures which might lead to prolonged labour as there would be no overlapping of the baby's skull bones during labour to facilitate descent of the fetal head (Mellish, 1996:42). In modern midwifery, tablets such as prostaglandin and intravenous infusion of oxytocin are used to induce labour pains in case of post maturity (in cases where pregnancy has exceeded the normal expected date for delivery). In cases of severe, unbearable labour pains, an analgesic of pethidine 100mg/50mg or epidural analgesic is given to relieve labour pains (Sellers, 2001b:486).



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Hygiene during pregnancy was taken into consideration to prevent infection which may later affect the baby. These Hebrew midwives were also responsible for cutting the navel (cord), washing in water, rubbing with salt and wrapping in swaddling bands to prevent bleeding (Mellish, 1996:42). All these indicate the roles of modern midwives during antenatal clinic and labour for healthy mothers and babies with an Apgar score of 10/10 at one minute after delivery.

Midwifery ethos developed more rapidly than nursing ethos because midwives were private practitioners. Prominent authors gave much attention to it as it dealt with the lives of two people. Midwives were able to read and write in order to be able to comprehend the art through theory. In other words, they would be able to put theory (acquired knowledge) into practice (Searle, 1987b:34).

A midwife was expected to be competent to perform external version to save the mother's life and that of the unborn baby. In case of a difficult delivery, a midwife should have at least three assistants, one to rub the abdomen to stimulate contractions and apply fundal pressure, a second one to encourage the woman to bear down and monitor fetal heart and the third one to be ready to receive the baby and perform resuscitation where necessary (Searle, 1987b:36). All those measures were carried out for best the neonatal outcome, a baby born with an Apgar score of 10/10 at one minute.

Midwifery practice became more established and well-defined roles for midwives were spelled out. Soranus of Ephesus was the first obstetrician and gynaecologist who wrote about conception, menstruation and attention to problems of labour, though they were not specified. He described in detail the education, role and functions of midwives. Midwives of that time were responsible for performing abdominal palpation, vaginal examination and were able to note cervical changes during pregnancy. The mother was encouraged to deliver the baby in a kneeling position (Mellish, 1996:41).

Peter Chamberlain was the first physician who used the obstetrics forceps delivery instrument and it remained a secret in his family. The instruments were used during difficult deliveries and their outcome was good. Nothing had been said about the neonatal outcome and low Apgar



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score. Several instruments were introduced and rules for their safe use were laid down. Midwives were responsible for assisting the obstetrician during midwifery forceps delivery (Searle, 1987:36).

Primitive societies had definite sets of tribal customs which were clearly related to the practice of midwifery. These customs were to be observed and carried out by the midwives of those times. Failure to do that constituted a threat to the mother and the baby, therefore also the family and tribe. Harsh penalties for transgressions of the rules were imposed on non-observant midwives. The midwife had to observe the law of the group, and interact in a prescribed manner with mother and baby, family and tribe to achieve the goal of a healthy baby with an Apgar score of 10/10 at one minute after birth. A midwife was held accountable for her actions as is done by the Nursing Council as the controlling body of modern midwifery (Searle, 1987a:8).

The four core elements of professional practice, namely observance of custom (laws), independent action, interdependent action and accountability were discernible in the role fulfilment of midwives throughout the course of the history of midwifery. These characteristics are essential elements of professional practice in modern midwifery practice and indicate the fundamental need for a code of practice (Searle, 1990:32).

Modern midwifery is controlled by the Nursing Councils which were promulgated world-wide, for example, The South African Nursing Council in South Africa, the American Nursing Council in the United States of America and the Australian Nursing Council in Australia and thus the role of midwives has emerged. The nursing councils spell out the rules and regulations which include the scope of practice of midwives and conditions under which the council may take disciplinary action in case of acts or omissions, negligence or misconduct by the midwife (Searle, 1990:282).

Teaching and training of midwives took place in Britain and successful midwives were licensed. The Midwifery Act was passed in 1992 which set the rules for the conduct of midwifery and set minimum standards of professional practice. Midwives are responsible for antenatal supervision through health education of pregnant women. Babies are monitored before birth and early signs of fetal distress are noted and caesarian section done before the baby is damaged. Vacuum



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extraction, ultrasound and cardiotocograph are practised for the best possible outcome of the baby (Moodley, 2002:60).

In Britain, midwives were qualified to provide care on their own responsibility throughout pregnancy, labour, neonatal care and pueperium. They were able to recognize and diagnose the signs of abnormalities such as the presence of meconium-stained liquor as a sign of fetal distress, poor dilatation of the cervix despite the presence of strong uterine contractions as a sign of poor progress or delayed first stage of labour which required urgent attention to prevent a baby born with a low Apgar score of less than 7 at five minutes after birth (Robinson & Thompson, 1996:2)

### 2.3.2 South African development

Witchcraft and traditional birth attendance are understood by all of us. Some of the practices were positively dangerous with maternal and child mortality occurring. In general, there was lack of knowledge regarding child-bearing and this changed with the start of scientific enquiry in both the medical and nursing fields (Mellish, 1996:43). Well-educated, highly skilled and competent trained midwives of that time were needed. Midwives enjoyed a well-recognized status in the community and they had to face competition from granny midwives/traditional birth attendants (Pera & van Tonder, 1996:42).

The settlement of whites in South Africa in 1652 produced some records of birth practices following a Hottentot woman who gave birth unattended in 1654. Midwifery practices were rendered in the homes of the settlers and in the slave lodge in Cape Town by women who were regarded as midwives. The aim was the safety of the mother and the baby after delivery. Official midwives from the Netherlands were appointed by the Dutch East India Company to control midwifery practices and midwives were in possession of certificates which were granted after examination. Local midwives were also licensed to practice. Since then, midwifery has been regarded as a fundamental component of health care. A competent midwife was needed to assist the woman during child-bearing for the best possible outcome for the mother and the baby (Mellish, 1983:37).



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The shortage of midwives challenged the Batavian Republic authorities to establish a midwifery training school. Doctor Wehr, a male midwife (accoucheur), identified the lack of proper and competent midwives in the colony and its negative impact on the mother and baby, although it was not spelt out. He was appointed as the accoucheur of the colonial midwives and he drew up regulations for the training of midwives and established a midwifery training school in South Africa (Searle & Pera, 1992:25).

Mary Hist Watkins was the founder of a modern midwifery school in South Africa in 1892. Midwives were equipped with knowledge and skills so that they would be able to manage the woman during pregnancy for antenatal care, labour, pueperium and neonatal care for the best outcome of both mother and the baby (Mellish, 1996:45).

In Nottingham, most women booked for delivery with a district midwife at homes and they were at low risk. It is evident that there was a shortage of maternity beds and this resulted in district midwives delivering at home those who chose to deliver at home and those who could not be fitted into the system elsewhere. Some who had booked home deliveries were transferred to hospital due to identified complications that resulted in high perinatal and neonatal mortality but this was not indicated in numerical terms (Allison, 1996:4).

Women needed continuity of care from the midwife who delivered their baby. A district midwife would continue visiting the mother on a daily basis for seven days, for baby bath, eye and cord care, swabbing the vulva, care of the breast and encouraging the mother to breast feed (Allison, 1996:7).



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The number of qualified midwives increased and they attended to other areas where the neighbours and traditional birth attendants were assisting the woman during childbirth. Health education was given but care was taken not to undermine their prestige in the village community in order to gain their co-operation. Advance was made very slowly with patience and tact (Myles, 1976: xxvii). See pictures below for **professional African midwives from Mosvold and Murchison Mission hospital arriving to give perinatal care and visiting one of the babies they delivered to Zulu women**.



**Figure 2 (adopted from Myles et al, 1976: xxvii)**

The quantity of care that midwives provided to pregnant women during the child-bearing process and to their families depended on the education they received. Nevertheless, fewer research studies have focused on midwifery education than on midwifery practice where a number of major studies have been completed. For example, a study on the evaluation of a post-basic course for antenatal education fears, and another research study focus on the midwives themselves. It was indicated that if service was to be adequately and appropriately staffed, midwives should have opportunities for career progress and professional development (Robinson & Thompson, 1996:3). For example, male midwives and student midwives had career intentions



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to follow career pathways and development in the profession (Volume 3), and secondly these students had already made a start with identifying factors that would facilitate and constrain careers in midwifery.

Development took place until up to date where modern midwifery practitioners first undergo training to acquire knowledge and skills so that they are competent practitioners who have all the abilities and skills to perform midwifery practice for the best possible outcome for both mother and baby. In South Africa, the South African Nursing Council is the statutory body that controls the training and practice of midwives. There are rules and regulations that authorize the conditions under which midwives may carry on their profession (Searle & Pera, 1992:26).

## 2.4 CONCEPTUAL FRAMEWORK OF THE STUDY

A conceptual framework is a set of interrelated concepts that are grouped together in a rational scheme by virtue of their relevance to a common theme (Polit & Hungler, 1995:658). The title of this study focuses on the competence of midwives regarding the prevention of low Apgar scores. In this study the main framework was the competence of midwives, of which the legislation and Guidelines for Maternity Care in South Africa were the building blocks. They are the major factors that contribute to the competence of midwives regarding the prevention of low Apgar scores. Each of the two components outlines the important aspects relevant to the competence of midwives. A conceptual framework was considered appropriate for this study as it assisted the researcher in identifying the knowledge and skills of midwives and provided a context for the interpretation of the study results.

### 2.4.1 Legislation related to midwifery practice in South Africa

The South African Nursing Council (SANC) is a statutory council that controls and regulates the nursing profession. The legislature has made excellent provision through successive Nursing Acts and Regulations to regulate and control the practice of nursing in South Africa. The midwives practice their profession in accordance with the rules and regulations stipulated by the SANC. The regulations stipulate the conditions under which the midwives may carry on their



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profession (Searle & Pera, 1992:24).

**Regulation relating to the conditions under which midwives and enrolled midwives may carry out their profession No. R.2488 of 26 October 1990 as amended:**

The SANC stipulated this regulation with the aim that proper quality would be carried out during pregnancy and labour for a healthy mother and baby. The midwives must carry out their profession under conditions set out by this regulation in order to accomplish this goal. Midwives must ensure that all necessary equipment such as fetal scope, baumanometer, weighing scale, resuscitation facilities and other material such as suturing materials, drugs, sanitary towels needed for her practice are always available and in good working condition. Episiotomy scissors for performing an episiotomy and suturing materials have to be in readiness for suturing first and second degree tears (R2488, 1990:1).

Midwives must keep clear, accurate and legible records of the progress of pregnancy as recorded on the antenatal card, and of labour and pueperium including all emergency actions carried out. The pregnant woman is to be examined according to gestational age of pregnancy, that is once a month until the 28$^{th}$ week, then per fortnight until the 36$^{th}$ week, and lastly weekly, until commencement of labour pains. All investigations such as blood for syphilis serology are done during the first visit and results are reported and treatment given when necessary.

Midwives are expected to perform pelvic assessment of all primigravida to ascertain pelvic adequacy for normal delivery and if not, the woman is referred for hospital delivery to prevent prolonged labour which may lead to a baby born with a low Apgar score. Midwives must give health education during antenatal clinic on antenatal exercises, and preparation for labour to strengthen pelvic bones, ligaments and muscles for delivery. Cooperation on the part of the woman during labour prevents premature bearing down which may cause fetal distress ((R2488, 1990:2).



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All high-risk women with antepartum haemorrhage, pregnancy-induced hypertension, diabetes mellitus, multiple pregnancy, abnormal presentation and other conditions are referred to the medical practitioner. During labour and if the second stage of labour is eminent, a midwife must remain with the woman until the baby is delivered, depending on their condition. Midwives must never perform an internal examination in the case of antepartum haemorrhage to prevent aggravating the condition which may lead to fetal hypoxia (R2488, 1990:3).

Midwives must perform an episiotomy to facilitate delivery and prevent unnecessary perineum tear or complications, provided the head is on the perineum. Administration of lignocaine 1% to the perineum before performing an episiotomy must be done. In the case of eclampsia, abnormal vaginal discharge, premature labour before the 37$^{th}$ week, non-engagement of the fetal head, prolonged first or second stage of labour, fetal distress, abnormal uterine action and other complications, midwives must urgently refer the woman to the medical practitioner ((R2488,1990:4).

### 2.4.2 Maternity guidelines in South Africa

The Department of Health in England outlines the implications of the National Health Service plan for maternity services as "...Outlined this means knowing where pregnant woman are and how they want and need their care delivered and configured. It means understanding the local patterns of disadvantage and exclusion and designing services that reach out to ensure those most in need have prompt access to the support they need" (House of Commons Health Committee, 2003:200). The same applies to South Africa, where the implementation of maternity guidelines is in process.

According to the National Health Plan in South Africa, health services are planned and regulated to ensure that resources (human and material resources) are rationally and effectively used. This is done to make basic health care available to all South Africans. Maternal and child care have been identified as the highest priority reproductive health issues which require urgent attention in South Africa. The aim is to achieve optimal health for both mother and baby after delivery (ANC, 1994:20).



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The National Maternity Guidelines Committee developed and prepared the guidelines on maternity care to be distributed and implemented throughout South Africa. The guidelines were developed following a vast review of the literature on maternal issues by the committee concerned. The aim of the guidelines is to ensure that a healthy woman gives birth to a healthy baby. According to this study, a healthy baby is a baby born with an Apgar score of 10/10 at one minute after birth. A low Apgar score of 7/10 or less is regarded as a problem that requires preventive measures (Godi, Mhlanga, Saloojee, Steinberg & Tlebere, 2002:1).

According to Kime (1992:41), pregnancy, labour and birth are normal bodily processes that are uncomplicated when a woman receives skilled medical and emotional support by a competent midwife. The pregnant woman needs special care, protection and support at all times, putting emphasis on health promotion for the survival of the baby. Promotion of the health status of children is seen as an investment which means further investments in the future of the nation. Every person has the right to achieve optimal health, including babies, therefore no women and children must be allowed to suffer as a result of foreign debt or structural adjustment programmes. Maternal and child care services (antenatal care, delivery and post-natal care) are provided free of charge all over South Africa at the clinics and hospitals where these services are provided (ANC, 1994:45).

Midwives are health professionals who are concerned with maternal and child care services in order to achieve these goals. The purpose of the guidelines is to give guidance to midwives providing maternal and child care services at the clinics, community health centres and district hospitals where specialist obstetricians are not normally available. Pregnant women with obstetric problems are referred to Level II and Level III hospitals where there are advanced midwives and obstetricians available. The guidelines further give clear directions about the role of the midwife in the management process of the woman during pregnancy, labour, puerperium and neonatal care (Godi *et al.*, 2002:1).

A midwife is expected to be and must be committed to the provision of antenatal care services, and the management of the first and second stages of labour. These three aspects are the cornerstone of a healthy neonate with an Apgar score of 10/10 at one minute after birth. These



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three aspects will be briefly discussed below.

### *2.4.2.1 Antenatal care*

An antenatal care service is specialized antenatal preparation which is provided to pregnant women for the best possible pregnancy outcome for women and their babies. A midwife is solemnly responsible for rendering this type of quality health care to all pregnant women (Godi *et al.*, 2002:18). Every woman should follow guidelines for proper prenatal care encompassing good nutrition, general health, rest, exercise, and proper childbirth education. Every child deserves to be born as healthy as possible with an Apgar score of 10/10 at one minute.

Once a woman has decided to have a child, she should see her midwife for a complete physical assessment and examination. Pregnancy must be planned in advance as pregnancy will affect the woman's health and that of her unborn child. She would be advised to stop using contraceptives (birth control) such as pills or injections. If an intra-uterine device was used, a doctor should remove it and she should begin to maintain a healthy lifestyle that will help her to have a healthy baby with an Apgar score of 10/10 at one minute after delivery. This could include eating a well-balanced diet, exercise, avoiding alcohol and smoking cigarettes that could be harmful to the baby (Kime, 1992:19).

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According to South African guidelines, the midwife plays an important role prior to conception during family planning services. She provides health information to individuals, couples and community/target groups of mothers about the number and spacing of pregnancies. She is responsible for performing a complete assessment of the gestational age of pregnancy and risk factors may be identified during the first antenatal visit. As a result she encourages early booking at 4-5 weeks of pregnancy and a complete principal antenatal card is issued to every pregnant woman. Delayed or no antenatal care increases the risk of complications which may not be detected during pregnancy such as pregnancy-induced hypertension, intra-uterine growth restriction and other conditions which may result in severe maternal and neonatal morbidity and sometimes death (Centre for Disease Control & Prevention, 2000:396).



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The early weeks of pregnancy are so important because it is during that time that organs are formed. Certain substances such as alcohol, cigarette smoke and other chemicals may interfere with that growth and affect the fetus. Heavy alcohol intake during pregnancy could cause mental retardation, low birth weight and increased problems for the baby. Babies of women who abuse these substances are born with low Apgar scores of less than 7 at five minutes (Kime, 1992:19). Fetal alcohol syndrome is a complete physiological and mental defect in children due to maternal alcohol consumption during pregnancy (Kime, 1992:14).

A midwife is responsible for completing the antenatal card during each antenatal visit by the mother and the mother has to retain it until delivery. Careful and accurate gestational age estimation at first visit facilitates further management of the pregnancy. Early and comprehensive antenatal care (which includes promotive, preventive care and rehabilitative services) is the cornerstone of improving material and neonatal outcome, thus reduction of neonatal morbidity and mortality rates resulting from low Apgar scores (Ó Lúanaigh & Arlson, 2005:26).

Survey reports which were compiled from nine provinces in South Africa indicated that there were still problems such as large numbers of women who were giving birth in their homes; unsafe working conditions; large numbers of pregnant women who did not make use of antenatal services; hypertension and inappropriate management of eclampsia including antepartum haemorrhage (Hart, 2000:18). To support this, a study carried out in England indicated that 50% of pregnancies were unplanned and the women did not attend ante-natal clinics. One factor that contributed to this was that midwifery practices were sparse and fragmented. Recommendations were that midwifery services had the responsibility to ensure that all services were appropriate, effective, flexible, accessible, and focused to meet the needs of local communities (Cefalo, Bowes & Moos, 1995:407; Hellerstedt *et al.*, 1998:664). All those remained as the most common contributory causes of neonatal and maternal deaths. The outcome indicated that most of the babies were born with the problem of low Apgar scores. A midwife has the duty to take care that such types of problems are dealt with appropriately for a healthy mother and baby after delivery (Godi *et al.*, 2002:20).



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According to South African guidelines, a midwife is expected to be able to collect and record a full and relevant history during antenatal clinic which includes current pregnancy, medical conditions such as diabetes mellitus, hypertension, previous caesarean section, genetic disorders, and use of alcohol, tobacco and other substances. By doing this she will be able to identify some high risk factors such as diabetes mellitus, obesity (weight at delivery >90kg), multiparty, previous history of shoulder dystocia, post maturity (>42 weeks) as they are associated with shoulder dystocia, difficult delivery and macrosomic infant (Alexander, Levy & Roch, 1995:73).

Midwives need to be taught the formula for assessing the risk of shoulder dystocia. This formula was devised by O'Leary (1992:60) and it appears to be used widely in the United States of America. Women can be assessed during antenatal clinic and even while in labour. The risk scores can be used to identify those women at risk of shoulder dystocia.

**Antenatal risk factors for shoulder dystocia**

- Obesity >70 kilogram pre-pregnancy >90 kilogram at term
- Age >35
- Multiparity >5
- Diabetes mellitus or gestational diabetes mellitus
- History of previous infant and Post maturity (Alexander, 1995:73)

**Table 2.1 Antenatal shoulder dystocia risk score adopted from O'Leary (1992:60)**

| Factor | 2 | 1 | 0 |
|---|---|---|---|
| Estimated fetal weight (kg) | >4.3 | 3,8-4.2 | <3,8kg |
| Maternal weight gain (kg) | >16 | 12-16 | <12 |
| Maternal weight pre-pregnancy | >80 | 70-80 | <70 |
| Glucose intolerance | yes | suspected | >0 |
| Gestation | >42 | 41-42 | <41 |

A combined score of 8-10 represents the greatest risk, 4-7 intermediate risk and 0-3 negligible risk after O'Leary (1992:60).



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Screening during pregnancy is done to assess pregnancy risks and detect any minor disorders which may need immediate intervention by a midwife. A midwife is responsible for prescribing and issuing medication such as ferrous sulphate pills, folic acid tablets, ascorbic acid and gives an intramuscular injection of tetanus toxoid 0,5ml x 3 doses during pregnancy. Pregnant women should not take treatment not prescribed by the doctor including drugs bought without prescription, with instructions that come with drugs bought over the counter indicating that they are not meant for pregnant women. As indicated above, some may be harmful to the unborn baby (Kime, 1992:19).

Dissemination of health information through health education is done by a midwife. Antenatal education programmes can be effective in improving aspects of the physical and psychological well-being of women for healthy babies. Education on topics such as diet during pregnancy, antenatal exercises, and preparation for labour and childbirth is given to pregnant mothers during antenatal clinic (Robinson & Thompson, 1996:67).

A midwife must encourage community participation and involvement. Women, families and the community must be empowered to contribute actively to the improvement of maternal, perinatal and family health. Conditions that adversely affect the outcome of pregnancy such as sexually transmitted diseases should be treated effectively and addressed within the community involved. These measures are carried out for a healthy mother and baby after delivery (ANC, 1994:46). Emotional disturbances may be influenced by unplanned pregnancy, single parenthood, an unsupportive partner, homelessness and uncertainty about social circumstances. Support from family members and friends promote a woman's mental health which will further influence the infant's emotional and psychological health (Dunkley-Bent, 2004:33).

The main aim of a midwife's role is to ensure a positive outcome to pregnancy measured through the health of the mother after delivering and a healthy baby with an Apgar score of 10/10 after birth. Throughout the world numerous initiatives have been developed to tackle the problem of poor pregnancy outcome and high infant morbidity, sometimes leading to death. The World Health Organization has reported its concern about the high rate of mother and baby morbidity and mortality in developing countries. The Expert Committee Report outlines that neonatal



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mortality is caused mainly by poor nutrition and widespread infection such as untreated syphilis, and dangerous and excessive childbearing due to poor access to health services (WHO, 1992:4)

Essential screening investigations for syphilis serology, rhesus factor, haemoglobin level, human immune virus (HIV) and urine dipstick for protein, sugar and ketones is performed by a midwife for each pregnant woman. A midwife performs a full physical examination, abdominal inspection and palpation to detect height of fundus. A midwife must be skilful enough to be able to measure the symphisis fundal height using a tape measure and be able to estimate gestational age by dates and the use of ultrasound where available (Godi *et al.*, 2002:23). According to Maternity Guidelines, the final assessment to be carried out by a midwife includes pelvic assessment to exclude pelvic inadequacy and later on plan for delivery which may be conducted at the hospital or clinic, depending on the findings (Godi *et al.*, 2002:24).

### *2.4.2.2 Management of first stage of labour*

Labour is diagnosed if there is painful uterine contraction accompanied by both effacement and dilatation of the cervix, show or rupture of membranes (Godi *et al.*, 2002:31). The first stage of labour starts with the onset of labour pains with cervical dilatation from 1cm to 10cm. There is the latent and active phase of labour. The latent phase of labour is from the onset of labour pains until the cervical dilatation is 3cm. The active phase of labour starts from cervical dilatation of 3cm to 10cm dilatation (Godi *et al.*, 2002:33).

According to Maternity Guidelines in South Africa, during admission of a woman who is in labour, a midwife should carefully review the antenatal card of the mother and note all the risk factors such as vaginal bleeding, passage of meconium-stained liquor and refer to the obstetrician for immediate attention. With the knowledge and skills she has acquired, she must be competent in performing vaginal examination and abdominal palpation. A midwife must be able to diagnose the latent and active phase of labour (Godi *et al.*, 2002:31).



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A caring midwife is required during labour in order to reduce the fear, excitement, anxiety and apprehension which are experienced by the woman in labour. A good relationship between midwife and mother, taking decisions together about the progress of labour is very important. This promotes co-operation throughout labour (Alexander *et al.*, 1995:32).

A midwife assesses the progress of the woman's labour, identifies deviations from the norm, for example fetal distress and reports the woman to the doctor. During each procedure for labour, information is explained and it is found to be important to women at every stage of their labour. Women are more likely to be satisfied with their birth experiences because of continuous communication (Kirkham, 1993:67).

Hodnett (1994:469) supports the above by indicating that continuous support during labour reduces the likelihood of medication for pain like pethidine 100mg/50mg which, depending on the time of administration, may lead to a low Apgar score. Operative vaginal delivery is reduced and a five-minute Apgar score of less than 7 is reduced. The presence of a competent midwife also reduces the likelihood of a caesarian section delivery.

A partogram is used for every woman who is in labour. All observations are recorded on the partogram and these include fetal condition, progress of labour, maternal condition, intake and output, drugs and treatment given. Fetal condition is monitored and recorded half-hourly to identify early and late deceleration which may be a sign of fetal distress. Descent of the fetal head should correlate with the cervical dilatation and the strength of uterine contractions. Failure of this will lead to poor progress which will cause fetal hypoxia leading to a low Apgar score. A midwife must exercise her ability and skills to detect the presence of caput (swelling of fetal scalp), moulding (overriding of fetal bones of the skull) and passage of meconium-stained liquor. A midwife must have the ability to grade them as 1+, 2+ or 3+ and report for immediate intervention by the obstetrician as they may lead to babies born with low Apgar scores (Godi *et al.*, 2002:34).



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Support from partner, friends, family members is important as interventions by means of technology such as the cardiotocograph may leave the woman vulnerable and dissatisfied with her birth experience (Brown & Lumley, 1994:10). Women practise breathing techniques to reduce fear and pain and the husband/partner acts as the coach in the birth process (Kime, 1992:70).

Maternal conditions, that is temperature, pulse, respiration, blood pressure, urinalysis and contractions are monitored and recorded on the partogram. A midwife must seek immediate medical assistance in case of uncontrolled high blood pressure as this may cause intrapartum asphyxia or fetal hypoxia which may lead to babies born with low Apgar scores (Godi *et al.*, 2002:34).

The risk of shoulder dystocia should be re-assessed during the first stage of labour. The following risk score was adopted and may be used by the midwife to identify women who may be at risk of shoulder dystocia.

**Table 2.2 Intrapartum shoulder dystocia risk score adopted from O'Leary (1992:60).**

| Factor | 2 | 1 | 0 |
|---|---|---|---|
| Antenatal score | 8-10 | 4-7 | 0-3 |
| 1st stage of labour | Prolonged latent phase | protracted | Normal |
| 2nd stage of labour | prolonged | borderline | Normal |
| Birth weight (kg) | >4.2kg | 3.8-4.2kg | <3.8kg |
| Forceps delivery | midcavity | Low/midcavity | Low |

A combined score of 8-10 represents great risk, 4-7 intermediate risk and 0-3 negligible risk. In high-risk women in labour such as trial of scar, antepartum haemorrhage, thick meconium-stained liquor, pre-eclampsia and diabetic mellitus, the fetal heart is monitored by cardiotocograph. Mismanagement of these women may lead to fetal hypoxia which will lead to a low Apgar score (Godi *et al.*, 2002:43).



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Failure to use the partogram during the first stage of labour constitutes substandard care by a midwife. The action line on the partogram represents extremely poor progress. Crossing of the action line demands immediate action. The woman would require transfer from clinic to hospital, oxytocin infusion is commenced or caesarian section may be done to save the mother and the baby (Godi *et al.*, 2002:34). It should be ensured that the correct use of the partogram becomes the norm in each institution conducting births.

### *2.4.2.3 Management of second stage of labour*

The second stage of labour starts from 10cm dilatation of the cervix and ends after the baby is delivered. Mismanagement of the first stage will lead to delayed second stage of labour with poor neonatal outcome. A competent midwife must be able to apply techniques for delivering the baby. Recording of the onset of the second stage of labour/time for bearing down and delivery time is done. This helps the midwife to identify signs of delayed second stage of labour which requires prompt attention for the best outcome for the baby (Pattison, Malan, Shaw & Delport, 1995:146).

A midwife must exercise her knowledge that the time frame for bearing down in primigravida is 45 minutes and 30 minutes in multiparous women. Failure to deliver within the expected time is considered to be a sign of delayed second stage of labour and it requires immediate action in order to save the baby. A midwife must be competent to be able to anticipate and diagnose signs of shoulder dystocia (impacted shoulder when only the head is born). The technique to deliver an impacted shoulder should be at the hands of a midwife because failure to acquire this may lead to neurological damage and a baby born with a low Apgar score of less than 7 at five minutes or death due to poor management of the second stage of labour (Godi *et al.*, 2002:48).

Measures such as vacuum extraction, forceps delivery or caesarian section may be applied by skilled and expert obstetric doctors and advanced midwives. Difficult delivery due to poor application of delivery aids may lead to a baby born with a low Apgar score of less than 7 at five minutes (Routledge, 1993:23).



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According to these guidelines, a midwife must continue monitoring the fetal heart before, during and after contraction. A midwife must put her knowledge of the indications of performing an episiotomy into practice and apply the technique of cutting in an episiotomy. An episiotomy is performed in order to hasten delivery, prevent prolonged second stage of labour which may lead to fetal distress and a baby born with a low Apgar score. A live healthy neonate with an Apgar score of 10/10 at one minute is expected following delivery. Gentle suctioning of the baby's nostrils and mouth must be carried out immediately after delivery of the head while still waiting for restitution (twisting back of the baby's neck) and external rotation of the baby. This is done to clear the airway and prevent aspiration which may lead to poor neonatal outcome.

Mismanagement of the second stage of labour may lead to poor neonatal outcome. A national campaign on training midwives and doctors in the use of the partogram as an emergency intervention strategy is in process in South Africa. Perinatal mortality outreach is also in process in each district in level II hospitals (Pattison *et al.*, 1995:6).

## 2.5 RESEARCH OUTCOME ON LOW APGAR SCORES

Low Apgar scores are a universal problem. Statistics for various research studies done on low Apgar scores remain constant. The outcomes are presented from international and African perspectives. The global perspectives discussed below are an expansion of literature discussed in items 1.1.1 and 1.1.3 of chapter 1.

### 2.5.1 International perspectives

A study was conducted in Kagoshima City Hotel in Japan in order to evaluate the fetal or neonatal outcome in patients with abruption placenta. The sample was 50 cases of placenta abruption and a case control was performed. The outcome of the study indicated neonatal death before discharge and cerebral palsy was diagnosed in the neonates who survived (Matsuda, Maeda & Kouno, 2006:330). Statistics indicate that of the 50 cases there were eight stillbirths and nine neonates died within 24 hours of birth. There were 20 neonates born with low Apgar scores of less than 7 at five minutes. Of the neonates who survived, 11 had neurological



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disabilities such as cerebral palsy (Matsuda *et al.*, 2006:331).

A retrospective case control study was carried out at Malmo University hospital. The aim of the study was to evaluate whether placental abruption still remained a major cause of neonatal morbidity and stillbirth. A sample of 161 women with placenta abruption was selected, and 237 women formed a control group. Women with placenta abruption had significantly high rates of smoking, intra-uterine growth restriction, pre-eclampsia and C/S (Lindqvist, 2006:160). The outcome of the study indicated that there were babies born with low Apgar scores of 1 at five minutes and less than 6 at ten minutes. According to statistics, 2.7% of the babies had Apgar scores of 1 at five minutes and 94.5% of the babies from the women with placenta abruption had Apgar scores of less than 6 at ten minutes. Results from the control group were not indicated (Lindqvist, 2006:164).

In Dungguan maternal and child health care hospital, a study was carried out on a total of 10 376 live-born neonates. The purpose of the study was to explore new and accurate diagnostic criteria for neonatal asphyxia. Five items were examined, including antepartum high-risk factors, low Apgar scores, umbilical blood pH, organ injury and differential diagnosis of low Apgar scores (Chen, He, Peng, Guo, Zhang & Yuan, 2006:167).

The results of the study indicated that 230 infants were born with low Apgar scores of less than 6 at five minutes and they had neonatal asphyxia. The 94 babies with umbilical artery had Apgar scores of less than 6 at five minutes. In conclusion, it was also indicated that antepartum high-risks factors, low Apgar scores, umbilical artery blood pH and dysfunction of three or more organs were the diagnostics of asphyxia neonatarum. The study did not indicate the neonatal outcome (Chen *et al.*, 2006:170).

In Kars EI Aini University hospital, a case control study was carried out on 50 women with pre-eclampsia. The aim of the study was to evaluate cerebral/arterial resistance and low Apgar scores at five minutes of neonates of the mothers who had pre-eclampsia. The control group of thirty women without the condition was taken. Apgar scores were assessed after five minutes of



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delivery and low Apgar scores of less than 6 at five minutes were identified (Ebrashy, Azmy, Ibrahim, Waly & Edris, 2005:821).

The outcome of the study showed that 38 of the 50 cases had neonatal morbidity with intra-uterine growth restriction and they were admitted to neonatal intensive care unit (NICU). The period of stay in NICU was not stated. The remaining 12 cases had umbilical artery resistance and an additional five of the infants with intra-uterine growth restriction also had umbilical artery resistance. The control group was not affected at all. The results also indicated that of the 50 cases there were babies born with low Apgar scores of less than 6 at five minutes but statistics were not indicated in numbers (Ebrashy *et al.*, 2005:826).

In Kuopio University hospital a study was carried out in order to assess the pregnancy outcome in different BMI groups. The research study was conducted from Jan.1989 - Dec.2001 where 25 601 single pregnancies were analyzed (Raatikainen, Heiskanen & Heinonen, 2006:165). A self-administered questionnaire was complemented by nurse interviews and analysis of clinical records for pregnancy at 38 weeks. Multiple logistic regression analysis was used to control for confounding factors (Raatikainen *et al.*, 2006:167).

At the end of the study the results showed that overweight and obese women had more stillbirth deliveries, miscarriages, diabetes mellitus, hypertension and they smoked more than women of normal weight. The outcomes of pregnancies were impaired and babies were born with low Apgar scores of less than 6 at five minutes. According to the statistics, 198 babies had Apgar scores of less than 6 at five minutes; 137 babies were admitted to neonatal units; 161 were delivered by caesarian section and there were 191 stillbirths. It was concluded that overweight conditions increased the risks in a BMI (Body Mass Index) dependency manner (Raatikainen, *et al.*, 2006:168).

Another study was conducted in the United States of America (USA) from 1995 -1997. The aim of the study was to assess the risks of neonatal mortality and morbidity in vertex-vertex second twins. Information was gathered from a historical cohort study on a twin registry. The criterion was set for maternal age, marital status, parity, cigarette smoking during pregnancy and



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gestational age of pregnancy. The sample was 86 of 1 vertex-vertex second twin that met the criteria (Yang, Wen, Chen, Krewski, Fung & Walker, 2006:3).

The sample was classified into two groups. The first group (c-c group) of 43% was where both twins were delivered by caesarian section (C/S), and the second group (v-x) of 57% was those of which the first twin was delivered vaginally and the second twin by caesarian section. The outcome of the study indicated that statistics of low Apgar scores were higher in those who delivered the first twin vaginally and second twin by C/S than in the group in which both were delivered by C/S. Asphyxia related to neonatal death was 4% in the second group and none in the first group. 22% (13) of the neonates were born with low Apgar scores of less than 6 at five minutes. The researchers concluded that the risks of morbidity and mortality were high in vertex-vertex second twin where the first twin was delivered vaginally (Yang *et al.*, 2006:8).

In Washington State a retrospective analysis of birth certificates, infants and neonatal death certificates was conducted for 5 138 pairs of twins. The sample was selected from 12 644 pairs of twins born between 1989 and 2001. Demographic information for maternal and neonatal medical information was collected via checkbox format on birth certificates. The aim of the study was to determine whether the second twin (B) had higher morbidity and mortality than the first twin (A). Both pre-term and term pregnancies were included in the study. Data was analyzed through Statistical Package of Social Science (Hartley & Hitti, 2005:375).

Twin A was vertex and delivered vaginally and twin B was breech. Of these 22% were delivered by C/S. The delivery interval was more than fifteen minutes for both of them and this increased the risk for twin B. Results of the study indicated that twin B had a higher risk of fetal distress than twin A, regardless of the gestational age. Twin B babies were born with low Apgar scores of less than 7 at five minutes. The risks of increased mortality and low Apgar scores increased in pre-term pregnancies compared to term pregnancies (Hartley & Hitti, 2005:377).

The outcome of the study indicated that babies were born with an Apgar score of less than 7 at five minutes. These babies had higher rates of neonatal, infant and childhood deaths (1-8 years), cerebral palsy, mental retardation and other neurological disabilities than babies with Apgar



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scores of 7-10 at five minutes. Twin B had higher rates of intubation and resuscitation. Medical statistics showed 259 babies with Apgar scores of less than 7 at five minutes, 275 fetal distresses, 24 fetal deaths and 17 neonatal deaths. Recent studies from Sweden also suggest that the Apgar score provides a meaningful assessment of the newborn condition (Hartley & Hitti, 2005:379).

A retrospective study was conducted at Tanic hospital in the United Arab Emirates. Maternal and neonatal records of all term pregnancies with single normal breech were identified from 1 January 1996 to 31 December 2003. The study covered an eight-year period. The aim of the study was to compare the outcomes of vaginal and abdominal deliveries in breech presentation. A sample of 299 women with single normal breech presentation, adequate pelvis and estimated birth weight of equal to or less than 3700g was selected from 17 605 women who delivered at that time (Thwaini-Al-nizi,, Khayatá, Ezimokhai & Al-safi, 2005:263).

From that sample of 299 women, 203 delivered by C/S and 96 were offered a trial of vaginal delivery of whom 2 had to be done by C/S due to fetal distress. The outcome of the study indicated that there were infants who were born with low Apgar scores of less than 5 at five and ten minutes. According to statistics, two infants from C/S had low Apgar scores of less than 5 at five minutes. The two infants were intubated and ventilated. Of the vaginal deliveries, 13 infants had low Apgar scores of less than 5 at five minutes and only one infant had a low Apgar score of 2 at five minutes and had serious morbidity and was admitted to the NICU for four weeks. One infant who had an Apgar score of less than 4 at five minutes stayed in NICU for 24 hours and was later discharged (period not stated). Infants with serious neonatal morbidity recovered completely and they were normal at 6 years of age (Thwaini-Al-nizi *et al.*, 2005:264).

### 2.5.2 African perspectives

In South Africa the Millennium Development Goals were established and implemented with the aim of improving the survival of children below the age of five years. Despite the implementation of these goals an estimated four million babies die in the first four weeks of life (neonatal death). In other words, the neonatal mortality rate has remained constant. Out of 60 - 80% of neonatal deaths, 28% was due to prematurity and growth-restricted infants related to low



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Apgar scores. Pre-term babies had low Apgar scores of less than 7 at one minute (Pieper, 2005:492).

Although prematurity was identified as the primary cause of neonatal deaths, the Perinatal Problem Identification Program (PPIP) identified more possible preventable factors in neonatal deaths such as limited staffing and resources, overcrowding and infections. Midwives were expected to be competent in resuscitation because premature babies and growth-restricted infants were prone to low Apgar scores (Pieper, 2005:492).

Many of these components of essential newborn care are currently being addressed with the teaching of resuscitation of newborns in most pre- and postgraduate medical school curricula. An outreach programme to teach resuscitation skills to all staff (midwives) involved in newborn care is in process. Midwives are responsible for diagnosing perinatal infections such as sexually transmitted diseases and administering specific treatments so that the lives of many premature babies can be saved (Pieper, 2005:493).

Another study was carried out at Chris Hani Baragwanath Hospital (CHBH) from January 2000 to December 2002. The aim of the study was to assess the effects of prematurity on infants. The sample consisted of 2 164 very low birth-weight infants born alive or admitted to Chris Hani Baragwanath Hospital. Birth weights ranged between 500g and 1 495g with gestational age of 30 weeks to 33 weeks. 81% were less than 33 weeks and 31% were small for gestational age (Velaphi, Mokhachane, Mphahlele, Beck-Arnold, Kuwanda & Cooper, 2005:504).

The outcome of the study indicated that 1 566 infants survived, 598 (55%) died in the neonatal unit and 85 died in the labour ward nursery before admission to the neonatal unit. The cause of death was identified as prematurity. A significant number of infants did not have Apgar scores recorded. Only 19% and 6% had Apgar scores of less than 6 at one minute and five minutes respectively. According to statistics forms 369 deaths (63%) were due to prematurity, 46 (29%) were due to infection which was culture proven, 28 (5%) due to perinatal asphyxia, 17 (27%) due to congenital abnormalities, 158 (27%) due to sepsis and 15 (2%) due to causes unknown (Velaphi *et al.*, 2005:507).



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A study was carried out to evaluate the use and effects of oxytocin in the induction of labour or augmentation in cases of inefficient uterine contractions. Three hundred and fifty (350) questionnaires were drawn and distributed to specialist obstetricians in South Africa (Basson, Odendaal & Grove, 2005:28). The research outcome stated that labour was induced only when delivery would benefit the health of the fetus and the mother. It had been stated that induction should not be done in case of multiple pregnancy, trial of scar, and grandemultipara because of the high risk of uterine rupture and fetal distress which may lead to low Apgar score. An Apgar score of less than 7 at five minutes was identified with a significantly higher vacuum extraction rate (Basson *et al.*, 2005:34).

Midwives are expected to be competent in monitoring the fetal heart. Early detection of fetal distress may need immediate attention by obstetricians for the best possible neonatal outcome (Basson *et al.*, 2005:38).

In Umtata General Hospital in the Eastern Cape, a study was carried out in an attempt to reduce C/S rates without compromising fetal and maternal outcome. The study was done from 1 February 1989 to 31 January 1992. The sample consisted of 478 twin deliveries of which 38 had previous C/S x 1. Of the 38, nine agreed to undergo trial of labour after potential risks of uterine rupture due to over-distension of the uterus in twin pregnancy (Essell & Opai-Tetteh, 1996:279). The outcome of the nine women was that the second twin was affected. The Apgar scores were 3-8 after five minutes and there were two neonatal deaths due to severe asphyxia and prematurity. No further outcome was indicated regarding the survival of the remaining infants Essell (*et al.*, 1996:280).

A cohort analytical study was conducted of 47 primigravida in spontaneous labour at Stellenbosch and Tygerberg hospitals. The aim of the study was to evaluate the outcome of labour. The group was divided into two. Group 1 consisted of 23 women with coupled contractions (contractions which indicate dysfunctional uterine activity) and group 2 consisted of 24 women who had normal uterine contractions. Labour was monitored and progressed in both groups (Ferreira & Odendaal, 1994:20).



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The outcome of labour of group 1 was that seven patients had C/S due to prolonged labour, three had assisted midwifery forceps delivery, two had vacuum extraction and the rest had normal vaginal delivery. From group 2, no C/S was done, two had midwifery-forced delivery and vacuum extraction and the rest delivered normally (Ferreira & Odendaal, 1994:21).

The neonatal outcome regarding Apgar scores was more or less the same in both groups. The statistics of low Apgar scores were that two infants had Apgar scores of 8 at one minute, two infants had Apgar scores of 9 at five minutes, and eight infants had Apgar scores of 9 at ten minutes. The main cause of low Apgar scores was considered to be fetal distress. No further outcome was stated about the infants' condition (Ferreira & Odendaal, 1994:23).

## 2.6 RESEARCH OUTCOME REGARDING THE COMPETENCE OF MIDWIVES

The Australian Nursing and Midwifery Council (ANMC) developed a questionnaire for national competency standards for midwives to assess the competency of midwives. The ANMC defines competence as "the combination of skills, knowledge, values and abilities that underpin effective and/or superior performance in a profession/occupational area" (ANMC, 2006:32).

ANMC, Nursing and Midwifery Board endorse the midwife competency assessment and learning plan which was to be reviewed in February 2009. The research was undertaken by a team of expect midwifery consultants. Midwives were expected to complete one questionnaire each for themselves, and a second was to be completed for her by the midwife's manager/peer/supervisor as an assessment of her practice and the results were compared. The outcome of the self-assessment and that of her manager/peer were used to develop and implement midwives' learning plan (ANMC, 2006:32)

The ANMC and midwifery regulation authorities produce the National competency standards for midwives in conjunction to assist them to deliver safe and competent care to both mother and baby during pregnancy and labour. According to the ANMC, a midwife is a person on entry to the practice of midwife who practices her profession within the parameters of legislation and common law (ANMC, 2006:33)



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In cases where the women or babies have complex need for referral, the midwife collaborates with other health professionals and midwives, protects, promotes and supports her, respecting the woman's choice in the interests of the infant to initiate, supply and administer relevant substances in a safe and effective manner. This is done during antenatal care, labour and birth to achieve the goal of a healthy mother and healthy baby (ANMC, 2006:34).

The ANMC (2006) identified and interpreted laws in relation to midwifery practice including the administration of drugs such as pethidine 50mg/100g in case of severe/unbearable labour pains. Midwives had to adhere to legal requirements in all aspects of accurate documentation. A competent midwife who recognized and responded to any urgent or emergency situation with timely and appropriate intervention would consult and refer the woman, for example, in case of cord prolapse and fetal distress. She would maintain up-to-date skills and knowledge concerning emergency plans and protocols. She would promote safe and effective midwifery through application of knowledge, skills and attitudes to enable woman-centered care (Kennedy & Grubbi, 1997:135; Watkins, 2000:339).

In Tasmania the code of practice for midwives was developed by the Nursing Board in accordance with Section 11 of the Nursing Act of 1995. The purpose was to provide practical guidance to midwives in Tasmania and to inform consumers about the role and responsibilities of midwives. Midwifery is the care of a woman by a midwife during pregnancy, birth and after the birth of the child, including care of the newborn baby and other areas of women's health and family. Childbirth is viewed as a normal life event and midwives practice within a primary health care model. Midwives must be competent to:

- provide childbirth and health education for women;
- undertake all aspects of antenatal care for women with normal pregnancy, consult and refer where necessary to offer professional health care;
- provide continuity of care and support during normal labour, monitor maternal, fetal and labour progress;
- assist and deliver the woman on her own responsibility;
- provide appropriate action in complicated labour and birth and other emergency situations;



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- undertake continuity education which keeps his midwifery knowledge, skills and attitude relevant and contemporary and enhance continuous improvement (ANMC, 2001:2).

In the Wangaratta Community Midwife Programme (CMP) a regional referral centre was managed by five part-time midwives. They were responsible for caring for 120 women per year. The Community Midwife Programme was a leader in the management of midwifery. Other rural and regional areas were encouraged to adopt its style of rendering midwifery services. Midwives were responsible for giving health education during pregnancy and parenting. Every woman was expected to meet the midwife before delivery so that pelvic assessment could be carried out and the outcome of delivery could be predicted. In case of pelvic inadequacy either due to a big baby or contracted pelvis, women were referred for hospital delivery to prevent prolonged labour or difficult delivery which may lead to a baby born with a low Apgar score of less than 7 at five minutes (Haines, 2005:35).

The duties of midwives were to perform abdominal inspection and palpation, estimation of fetal weight and screening of the pregnant woman for high risk conditions up to delivery. Women with complicated pregnancies such as diabetes mellitus in pregnancy, pre-eclampsia, or hypertension were referred to an obstetrician as the anticipated outcome was a neonate born with a low Apgar score of less than 10/10 at five minutes. The Community Midwife Programme for midwives had close collaboration with medical colleagues and they shared care of the women with high risk factors. Professional development was identified as the key to success (Haines, 2005:36).

The outcome stated that other rural and regional area midwives were identified as requiring further skills to provide comprehensive care for the pregnant woman up to delivery. Midwives were expected to have acquired knowledge and skills in counseling, screening of pregnant women, monitoring of fetal heart using cardiotocograph and interpretation of the findings such as signs of fetal distress which required urgent attention to prevent a neonate born with a low Apgar score of less than 10/10 at five minutes, cutting and suturing during an episiotomy. Referrals from general practitioners to the Community Midwife Programme services had grown because the midwives were highly skilled and competent in maternal services (Haines, 2005:38).



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In the United state of America, traditional birth attendants were still responsible for maternal services although they were unable to treat complications and had to refer. There was a need for skilled birth attendants at delivery in order to prevent maternal and neonatal morbidity and mortality. Qualified midwives were not available in rural areas and community settings.

A study was carried out in Nepal where there was minimum competency and limited facility-based obstetric care available. The aim of the study was to evaluate the skills and knowledge of midwives acquired after a short course in maternal services (pregnancy and labour) (Carlough & McCall, 2005:207). Midwives were between 18 and 35 years of age and had completed a 15-week course in maternal and child health care services. A six-week refresher course was offered to 104 randomly-selected midwives from 15 districts across Nepal. The outcome of the study stated that midwives had gained acceptable knowledge and skills which were demonstrated in a practical situation. Midwives were allowed to practice what they had been trained to do. Maternal and child health professionals were widely spread and available to affect neonatal morbidity. Logistical and policy support were formulated and implemented to achieve the goal of a healthy baby after delivery (Carlough & McCall, 2005:207).

South African education and training has made competence a national priority. The South African Nursing Council (SANC) requires that the beginner midwife has to have the necessary knowledge, skills, attitudes and values to render efficient professional service. The health care system demands a competent nurse practitioner to render quality health care (Morolong & Chabeli, 2005:38).

A study was carried out in two general hospitals where newly-qualified midwives were working. The aim of the study was to evaluate the competence of newly-qualified midwives in the prevention of low Apgar scores. The sample was 26 newly-qualified midwives. They were selected by simple random sampling from a target population of 66 newly-qualified midwives. A quantitative, non-experimental design was used. An instrument was used based on the steps of the nursing process (Morolong & Chabeli, 2005:42).



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Data was collected from two hospitals where they were working. Observation and questioning were used as data collection technique. Participants' rights were protected. A descriptive statistical method of data analysis was used. Findings of the study revealed that newly-qualified midwives were not competent. The highest score was 51% and the lowest 22%. Newly-qualified midwives lacked knowledge, skills, attitude and values which resulted in poor neonatal outcome though it was not indicated in numerical terms (Morolong & Chabeli, 2005:48).

The recommendations made were an improvement in clinical accompaniment, review of clinical learning facilities where learners were allocated and review of the midwifery curriculum. Further research studies on the competence of midwives need to be carried out (Morolong & Chabeli, 2005:49).

In Indonesia, programme evaluation was conducted of village midwives who attended in-service training, midwives who received an internship programme and midwives who attended no programme. The aim of the study was to compare their knowledge, skills and confidence in midwifery practice. Competency was evaluated under five key skills that is the prevention of infection, use of partogram, manual removal of the placenta, bimanual compression of the uterus and neonatal resuscitation (McDermott, Beck, Buffington, Annas, Supratikto, Prenggono, Ekonomi & Achadi, 2001:218).

The outcomes of the study indicated that midwives from intensive in-service training had combined competence-based skills training with peer review. They had scored higher on the knowledge test, demonstrated the five key skills and reported and managed the complications better than those who had attended no programme. The skills scores were 71% for midwives from the intensive programme, 62% for interns and 51% for midwives with no in-service training. They were competent in recording fetal condition, progress of labour and maternal condition using the partogram. They took urgent action in identified poor progress and delayed 1st and 2nd stages of labour in order to prevent low Apgar scores among the neonates (McDermott *et al.*, 2001:223).



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A study was carried out in Australia at Mercy hospital to see if the traditional midwifery and medical training did not consider identification and management of challenging problems such as depression, child abuse and substance abuse when providing antenatal care. They forget that such challenges may have a negative impact on the mother and the baby if not considered. The outcome indicated that there was poor co-operation from the woman during labour which resulted in poor neonatal outcome. The recommendation was that a new approach to a psychosocial risk assessment programme be offered to provide psychosocial risk screening in pregnancy (Gunn, Hegarty, Nagle, Forster, Brown & Lumley, 2006:46).

A new approach was used to evaluate the effects of the six months' educational intervention for health professionals. A sample of 27 participants was used. The survey covered issues such as perceived competency and comfort in dealing with specific psychosocial issues, self-rated communication skills and open-ended questions about their experiences of the educational programme completed (Gunn *et al.*, 2006:50).

The outcomes of the study reported significant gains in knowledge of psychosocial problems and competence in dealing with them. The programme also increased the self-report comfort and competency of health professionals in the identification of and caring for women with psychosocial issues. The final outcome was healthy mothers and babies after delivery (Gunn *et al.*, 2006:54).

A study was done in John Radcliff hospital to assess the value of clinical competence in the role development of fertility nurses, that is, newly-qualified midwives. The Oxfort fertility programme was used. The programme enabled the new staff to demonstrate their clinical ability and undergo assessment while learning new and expanded skills such as pelvic assessment to diagnose pelvic inadequacy; per vaginal examination to diagnose progress of labour. They were required to explore both theoretical and practical foundation (Barber, 1999:5). Competencies were used in a structured programme in which staff had to provide evidence of appropriate knowledge to perform new and expanded procedures. Newly-qualified midwives' performance would be assessed and she would be guided and supervised for best management of women during labour. The expected outcome was a healthy mother and baby (Barber, 1999:6).



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The United Kingdom Central Council for Nursing (UKCC, 1992:7) also placed emphasis on professional development and made regulations related to the scope of practice for professional midwife nurses in 1977. Midwives were required to have acquired knowledge and skills related to her midwifery practice such as accurate recording of the partogram during labour (Barber, 1999:8).

A study was carried out in the United States in Bronson School of Nursing, Western Michigan University. The aim of the study was to present evidence for the inclusion of selected midwifery skills (tasks) as essential practice competencies for midwives throughout the world. During discussion it was indicated that evidence-based practice was characterized by the use of best practices derived from rigorous research studies. Midwifery practice was considered an art based on common sense, tradition and woman-centered approaches to caring (Fullerton & Thompson, 2005:2).

Most women who seek midwifery care are healthy and they just require a health promotion model of care by midwives. Midwives are expected to provide antenatal services where they perform abdominal palpation, physical examination, give health education to expectant women about a healthy life-style such as avoidance of alcohol intake, drug abuse, diet, care of breast, and preparation for labour and childbearing. Intervention is indicated to save the lives of both mother and baby. Though the study does not state anything further, it is assumed that good management of a pregnant woman during antenatal clinic and labour leads to a neonate born with an Apgar score of 10/10 at one minute. It is further indicated that a competent midwife needs to understand where gaps exist in support of traditional practices that have yet to be fully examined, in a scientific manner. The goal is for a healthy mother and baby after delivery (Fullerton & Thompson, 2005:10).

Another study was carried out in the South of England in a large urban maternity hospital and its community area. The aim of the study was to assess the competency in clinical skills of student midwives, midwives and midwifery managers and teachers in the management process of women during pregnancy and labour. The design of the study was ethnographically-grounded theory. Data was collected through observation of clinical safety and interviews. Observation,



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indirect learning and trial and error were strategies used by midwives and student midwives to obtain competency in clinical skills (Chamberlain, 1997:86).

The outcome of the study indicated that the learning of student midwives was interfered with or affected by anxiety, which was aggravated by inadequate supervision and instruction, including poor communication. They felt ill at ease and reluctant to function as midwives. The midwives were lacking in skills to perform some of the procedures such as estimation of fetal weight and difficult deliveries. This resulted in poor management of women during labour which led to complications with morbidity and mortality in both mothers and babies, though it was not indicated in numerical terms. Recommendations were that clinical midwives needed to be educated to facilitate transfer of theoretical learning into clinical practice, and teachers needed to re-learn the experience of being clinical midwives. Midwives were expected to correlate theoretical knowledge of midwifery into practice for the best possible outcome of babies born with Apgar scores of 10/10 at one minute (Chamberlain, 1997:89).

A study was carried out in Scottish homes, in England and in Wales in 1980. The aim of the study was to investigate the role and responsibilities of midwives. The sample consisted of 200 midwives of whom 187 returned the questionnaire. The research had two phases, an interview and observation study followed by using postal questionnaires (Askham & Barbour, 1996:33). The outcome of the study indicated that some midwives were satisfied with their role and responsibilities during antenatal care and labour. Others were not satisfied though this was not stated in numerical terms. Midwives practising at clinics were covered by a medical practitioner to whom they referred women with problems.

In a labour ward, midwives were qualified to monitor and assess the progress of labour and conduct delivers under their own responsibility. Induction of labour was done with monitoring of fetal heart using a cardiotocograph machine to detect early signs of fetal distress. Caesarian sections were done to prevent low Apgar scores. Advancement in technology influenced training and development of midwives. Policy guidelines indicating when to summon the doctor were implemented for the management of women during labour and a medical doctor was called in case of complications (Askham & Barbour, 1996:41). No woman in labour was to be admitted



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and delivered without having been examined by [illegible] member of the medical staff. Care was provided to the standard they perceived as desirable for a healthy mother and baby after delivery (Garcia & Garforth, 1991:36). Recommendations for that study were the publication of changing childbirth figures in order to restore and maintain the role of midwives in England and Wales. In Scotland, Provision of Maternity series was published (Department of Health, 1993:2).

## 2.7 CONCLUSION

Worldwide, statistics of low Apgar scores remain constant and a low Apgar score has negative implications for the baby. All health care facilities or institutions are expected to provide efficient and effective maternal and child care services for the best possible outcome for both mother and baby. To achieve this goal, all midwives are expected to have acquired knowledge and skills which enable them to practice their midwifery profession as expected by the statutory body which is the South African Nursing Council. Further research studies need to be carried out about the competence of midwives with regard to the prevention of low Apgar scores among neonates.



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# CHAPTER 3

# RESEARCH DESIGN AND METHODOLOGY

## 3.1 INTRODUCTION

According to Leedy (1997:104), methodology is defined as an operational framework within which data are placed so that their meaning may be seen more clearly. This chapter outlines the research design and methodology, the population under study, the sample and sampling approaches and the data collection instrument. Data quality, ethical consideration, permission to conduct a study, data analysis and concluding remarks are also covered.

## 3.2 RESEARCH DESIGN

Research design is defined as the overall plan for collecting and analysing data including specifications for enhancing the internal and external validity of the study (Brink, 2003:214; LoBiondo-Wood & Haber, 2002:492; Polit & Hungler, 1995:652). Burns and Grove (1999:261) refer to the research design as "a blueprint for conducting the study that maximizes control over factors that could interfere with the validity of the findings". Research design is further considered to be the entire strategy for the study, from identifying the problem to the final plans for data collection. Secondly, it is limited to clearly defined structures within which the study is implemented (Burns & Grove, 1999:261). As a blueprint, the design is not specific to a particular study but it is a broad pattern or guide that can be applied to many studies. Designing a study helps the researcher to plan and implement the study in a way that can help the researcher to obtain the intended results, thus increasing the chances of obtaining information that could be associated with a real situation (Burns & Grove, 1999:262).

Hanley and Belfus (2003:103) defined research design as "a plan for how the researcher will study and ultimately answer the question at hand." Studies are planned to guide the generating and analysing of data so that we can be more confident of the results. The purpose is to provide the plan for answering research questions (LoBiondo-Wood & Haber, 2002:188), while Brink



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(2003:112) further states that the purpose of the research design is to determine methods used by the researcher to obtain subjects, collect data, analyse the data and interpret the results. In this study, a quantitative descriptive approach was used to assess and describe the competence of midwives with regard to the prevention of low Apgar scores among neonates.

### 3.2.1 Quantitative design

Quantitative design is a formal, objective, systematic process in which numerical data are utilized to obtain information about the world (Burns & Grove, 2001:48). Polit & Hungler (1995:447) define the quantitative approach as the research design where information collected in the course of the study is in quantified form. This approach was used since it is concerned with numbers and frequencies; it also uses structured procedures and formal instruments to collect numerical information under controlled conditions. The quantitative approach is used to describe the variables, examine the relationship among variables and determine cause and effect interactions between variables (Polit & Hungler, 1995:448). During the present study, numerical data were collected to assess the competence of midwives with regard to the prevention of low Apgar scores among neonates in the Vhembe district of Limpopo Province from March to April 2007 from three selected hospitals, namely Hospital A, Hospital B and Hospital C.

Literature discussing the advantages and disadvantages of the quantitative design is voluminous (Brink & Wood 1998; Burns & Grove, 2001; LoBiondo-Wood & Haber, 2002; Polit & Hungler 1995). Some of the advantages of using the quantitative design in this study were as follows:

- It removed much of the guesswork from gathering information. The information was objective and based on explicit rules in the questionnaire.
- It was possible to obtain reasonably precise information, for example, instead of describing a favourable Bishop score of induction as a combination of cervical condition and station of presenting part, it could be depicted as a score of 6, 8, or 10.
- It was used to determine whether what the midwives said generally held true of being competent in performing midwifery skills to prevent low Apgar scores among neonates.



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- It was possible to measure the incidence of various views and opinions regarding the contributory factors of low Apgar scores including preventive measures in a chosen sample.
- Statistical data were in the form of tables. Findings were conclusive and usually descriptive in nature.
- It was not expensive and less time consuming as much of the information was gathered within a short period of time.
- It provided more representatives, reliable and precise measures through focused hypotheses, measurement tools and applied mathematics.

On the other hand the design had disadvantages and the following were observed in this study:

- A non-probability sample was used for the study. Generalisablity of the findings was limited. Additional replications drawing from various methods may be needed to improve the generalisablity of the findings.
- Directions for obtaining measurements, although clearly explained in the questionnaire, might be vague or poorly understood by the midwives, for example, there could be different interpretations of questions by the respondents.
- The midwives were subjected to selection of one of the four responses that best reflected their position, for example strongly agree, agree, strongly disagree, or disagree. The degree of expression reflecting their competence was therefore limited. Certain important questions could perhaps not be answered efficiently and effectively.
- The questionnaire design did not allow for diversity in responses, nor did it have the capacity to adapt to new developments or issues during the research process itself.

### 3.2.2 Descriptive study

Polit and Hungler (1995:640) refer to descriptive research as "research studies that have as their main objectives the accurate portrayal of the characteristics of individuals, situations or groups and the frequency with which certain phenomena occur". Brink (2003:208) refers to it as "research studies in which phenomena are described or the relationship between variables is examined; no attempt is made to examine the cause and effect relationship." This study was



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descriptive because the aim of the study was to assess and describe the competence of midwives in a specific area, only midwives working in maternity units. The study also complied with one of the characteristics of descriptive research stipulated by Brink and Wood (1998:283) in which demographic information obtained could help to describe the population of midwives who provide maternal and child care services and practice in maternity units from three selected hospitals. According to by Nieswiadomy (1993:123), in a descriptive study a phenomenon is described or the relationship between variables is examined. In this study, the phenomenon of Apgar scores and the competence of midwives were examined and described. The knowledge and skills of midwives were examined in relation to the prevention of low Apgar scores among neonates.

## 3.3 THE STUDY SETTING

The research study was conducted in a clinical setting at Government hospitals in the Vhembe district of Limpopo Province. Vhembe district is situated in the far north of Limpopo Province. Vhembe district has seven district hospitals and one regional hospital. The regional hospital is Tshilidzini which serves as a referral hospital to which the six district hospitals refer patients for specialised services. The seventh hospital is for maximum security psychiatric patients. Three district hospitals, Hospital A, Hospital B and Hospital C were chosen as sites for the study to be conducted. The choice appeared to be relevant because they were located less than 40 kilometres from where the researcher resides, and the researcher was working at one of the hospitals where the study was conducted. It was also easy to obtain the co-operation of nurse managers and their assistance with the data collection process.

## 3.4 POPULATION

The population is the complete set of persons characterized by a designated set of criteria that the researcher is interested in studying (Brink, 2003:132; Brink & Wood 1998:125; Brockopp & Hastings-Tolsma, 1995:169; Burns & Grove, 1999:776; Dempsey & Dempsey, 1992:79; Mouton, 1996:135; Nieswiadomy, 1993:31; Seaman, 1998:233). It is necessary to identify the population in order to apply the results of the study to that specific group. Another important part



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of data collection is the selection of the study participants who will provide relevant data in relation to the study (Dempsey & Dempsey, 1992:79). The target population comprises the total number of cases to which the researcher wants to make generalisations (Polit & Hungler, 1995:230). The target sample of this study was 100 midwives.

### 3.4.1 The eligibility criteria

The researcher should have identified the population descriptors that form the basis of inclusion (eligibility) or exclusion (delimitations) criteria of the study that were used to select the sample from an array of all possible units (LoBiondo-Wood & Haber, 2002:240).

In this study eligibility criteria included the midwives employed at the three district hospitals who met the following criteria:

- Respondents must be midwives registered with the South African Nursing Council.
- Respondents must have at least six months and more experience practising in maternity units.
- Respondents must be practising in maternity units.
- Respondents may be either male or female midwives.
- Respondents must have the ability to comprehend and communicate in English.
- Respondents must give informed voluntary consent.

Midwives working in general units like internal medicine, surgery, paediatric, trauma, operating theatre and intensive care units were excluded from the study because they were not exposed to the management of pregnancy and labour.

## 3.5 SAMPLE AND SAMPLING

A sample is a subset of the population selected to participate in the study (Crookes & Davies, 2004:234; Polit & Hungler, 1995:652). Clamp and Gough, (1999:88) defines sampling as "the process of selecting a few elements from a population to represent the entire population. According to Brink (2003:133), Brockopp and Hastings-Tolsma (1995:169), Burns and Grove



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(1999:52), Garcia-Nu`n~nez (1997:71), LoBiondo-Wood and Haber (1998:250) and Talbot (1995:65), sampling refers to the process of selecting a sample from a population in order to gather data in a way that represents the population of interest. A sample is a portion or subset that is selected to represent the population of interest in a research study and the members of a sample are the subjects or participants or respondents. A representative sample of midwives working in maternity units was selected from the three above-mentioned district hospitals of Limpopo Province. Time and money were saved by selecting a sample to be studied rather than attempting to study the entire population of midwives from seven Vhembe district.

### 3.5.1 Non-probability sampling

Non-probability implies that not every element of the population has an opportunity of being selected as part of the sample as in convenience (accidental), quota, purposive and network sampling procedures (Burns & Groove, 2001:804; Crookes & Davies, 2004:230). In non-probability sampling the elements are chosen by non-random methods. For the purpose of this study the researcher selected only midwives who were working in maternity units as they were exposed to neonates born with low Apgar scores, unlike those working in general units like medical, surgical and other units.

The disadvantage of the non-probability sampling procedure was that it might have limited the generalisability of the findings and bias might be present. Non-probability purposive sampling was used in this study, however, to obtain samples of hospitals and participants. Purposive sampling is a technique in which the researcher selects a special group because there is good evidence that it is representative of the total population the researcher wishes to study (Treece & Treece, 1989:217). Burns and Grove (1999:246), Brink (2003:141) refer to purposive sampling as judgmental or theoretical sampling. This sampling method is based on the judgment of the researcher regarding subjects or objects that are typical or representative of the phenomenon (or topic) being studied or subjects who are knowledgeable about the question at issue (Brink, 2003:141). The researcher uses his or her own judgment to select those subjects who know the most about the phenomenon (Brink, 2003:135). Despite the fact that purposive sampling is commonly used in a qualitative approach, in this research study the researcher used this approach



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because there was good evidence that the selected sample was representative of the total population. All available midwives working in maternity units were considered to be representative of the phenomenon or topic under study, which was their competence with regard to the prevention of low Apgar scores among neonates. Midwives in maternity units were exposed to the provision of antenatal services including conducting deliveries on their own responsibility.

Table 3.1 below represents a sample from the three district hospitals.

**Table 3.1 Sample of midwives from the three selected hospitals**

| Hospital | Target population | Distributed questionnaires | Returned | Incomplete | Spoiled |
|---|---|---|---|---|---|
| Hospital A | 57 | 57 | 55 | 1 | 1 |
| Hospital B | 29 | 29 | 28 | 1 | - |
| Hospital C | 14 | 14 | 12 | 1 | 1 |
| TOTAL | 100 | 100 | 95 | 3 | 1 |

**Advantages of purposive sampling**

Purposive sampling allows the researcher to handpick the sample, based on their knowledge of the phenomenon under study. The researcher purposively chose participants who were seen to be able to add to, support or refute the developing theory in respect of the topic under investigation and thus provide the most relevant information in relation to the aims of the study (Crookes & Davies, 2004:120). Midwives working in maternity units were handpicked because of their knowledge and because they were considered to be competent in the management of pregnant women, monitoring and conducting deliveries with the aim of preventing low Apgar scores among neonates. The same sampling method was used in India at Chandigarh maternity hospital to identify the obstetric causes of low Apgar scores at one minute and five minutes after birth. The researcher conducted the study there from January to August 1998. The researcher used his own judgment to select only babies born with low Apgar scores of less than 7 at one minute after birth. The sample size was 222 babies born with low Apgar scores during that period. Maternity medical records of women who delivered babies with low Apgar scores were analysed and a



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report was compiled. The study yielded good results. The outcome of the study indicated that 64% of babies had Apgar scores of 4-6 at one minute and 36% had Apgar scores of less than 4 at one minute. 84% of these improved to 7 and above at five minutes. The contributory factors were identified as antepartum haemorrhage and pregnancy-induced hypertension (Jain, Bagga & Narang, 2005:2).

**Disadvantages of purposive sampling**

The potential of sampling bias may enter the selection process since this strategy relies on the researcher's knowledge and generalisability of the results is limited. Each member of the population did not have an equal chance of being included in the sample. Assessment was done using the key informant approach. A sample of experts was needed which met the inclusion criteria set for the study.

The allocation list of maternity staff of the three selected hospitals was used as a sampling frame from which the sample was chosen (Polit & Hungler, 1995:236). Since the researcher was only interested in midwives working in maternity units, all midwives from the allocation list were utilised as participants of the study.

## 3.6 DATA COLLECTION

Polit and Hungler (1999:226) define data collection as a process of information obtained in the course of study. Burns and Grove (1997:383) maintain that one of the exciting steps of the research process is the initiation of data collection. Data collection is the step-by-step process of gathering information from a specified sample of subjects about the variables of interest in the research study. The data were used in the statistical analysis to address the purpose and aims of the study, answer research questions and support or refute the hypothesis (Hanley & Belfus, 2003:171). Research data, particularly in quantitative studies, are often collected according to a structured plan that indicates what information is to be gathered and how to gather it. In this study self-administered questionnaires were handed to subjects (midwives) personally by the researcher. Data were collected by means of questionnaires from a sample of 100 midwives who



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were working in the maternity units from March to April 2007.

### 3.6.1 Data collection instrument

A questionnaire was selected as the most appropriate instrument for collecting data. Literature describes the questionnaire as a document used to gather self-report information from respondents through self-administration of questions and a printed self-report form designed to elicit information that can be obtained through written responses of the subjects (Brink, 2003:156; Burns & Grove, 2001:281; Mateo & Kirchhoff, 1999:259; Polit & Hungler, 1995:444). The researcher formulated and designed a questionnaire with closed and open-ended questions, bearing in mind the objectives of the study. This was done to offer opportunity to the participants to elaborate their knowledge. The researcher developed a questionnaire in English that was simple, clear and brief, so that the respondents would have no difficulty completing it (Cormack, 2000:305; Hicks, 1996:102; Mouton & Marais, 1991:224). The supervisor and joint supervisor corrected and verified the questionnaire before it was administered to the subjects.

The advantages of self-administered questionnaires were that they were completed at the hospitals' maternity units at the time of the visit and collected by the researcher. The researcher assisted the respondents by guiding them how to go about completing the instrument. The study was conducted without involving the service providers and as such did not disrupt the smooth running of the unit, and there was less opportunity for bias, unlike with the interviews.

### 3.6.2 Format

The questionnaire was formulated to capture the competence of midwives with regard to the prevention of low Apgar scores among neonates. The questionnaire contained both closed and open-ended questions and was divided into five sections.



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- Section **A** (items1-5) dealt with midwives' demographic data.
- Section **B** (items 6-57) covered midwifery skills, in which midwives had to determine whether they were competent or incompetent. The two-point Likert scale used was C; INC.
- Section **C** (items 58-80) consisted of a checklist of midwifery skills to assess the knowledge of midwives on performing those skills. The four-point Likert scale used was agree; strongly agree; disagree; and strongly disagree.
- Section D (items 81-83) consisted of three open-ended questions allowing midwives to give their own opinions which elicited any additional comments they wished to make.

The Likert scale is a widely-used scale and consists of several declarative items that express a point of view on a topic (Polit & Hungler, 1995:339). According to Polit and Beck (2004:327), the summation feature of such scales makes it possible to make fine discriminations among people with different points of view. In this study, the Likert scale assisted the researcher to collect data on the competence of midwives with regard to the prevention of low Apgar scores among neonates.

### 3.6.3 Pilot study

It was important for the researcher to double check the instrument before commencing the study to ensure that it worked properly. It would be frustrating and irritating to discover that the instrument is out of order after respondents have been collected from far and wide and they have to go away. That results in losing respondents, time, patience and motivation (Hicks, 1996:101; Mouton & Marais, 1991:137). A pilot study must always be conducted before one begins with a major researcher study.

A pilot study is a small version or a trial run done in preparation for a major study (Polit & Hungler, 1999:448). Polit and Beck (2004:726) refer to a pilot study as a preliminary run of the main study to highlight any problems which can then be corrected. Burns and Grove (2001:807) refer to it as a smaller version of the proposed study conducted to refine methodology such as treatment, instrument or data collection process.



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The purposes of the pilot study were that it was done to obtain information to improve the data collection instrument, to assess the feasibility of the major study (whether the subjects were available and the time required to conduct the study), assessing the time required to complete the questionnaire (Polit & Beck, 2004:169), to examine the reliability and validity of the research instrument, to refine the data collection and analysis plan, to establish whether instructions could be clearly understood by respondents and to establish freedom from bias as far as possible.

A purposive sample of 10 midwives was drawn from three different hospitals. The midwives were informed about the purpose and outcome of the study because the pilot study would form the cornerstone of the major research study. This would help to prevent bias in the results. The time frame was explained and that completion of the questionnaire would require 20-30 minutes. The questions related to demographic profile such as age and period or years of experience in maternity were not answered appropriately. For instance a blank space was left for years of experience, and open-ended questions were not all answered.

The researcher gained some experience in interacting with the respondents and also learned what would happen in the major study with regard to their willingness to participate (Brink & Wood, 1998:259). The respondents involved in the pilot study were not included in the major study (Brink & Wood, 1998:259). The researcher was able to test the use of the questionnaire and assess whether the questions were understood (Streubert & Carpenter, 1995:46). This further determined the reliability of the questionnaire (Abdellah & Levine, 1986:239). After the pilot study, the questionnaire was refined with the assistance of the statistician, supervisor and joint supervisor to eliminate and reduce the problems identified during the pilot study (Polit & Hungler, 1995:38).

### 3.6.4 Administration of the questionnaire

The researcher contacted the nursing service managers telephonically to secure appointment dates. Direct/personal contact was made where necessary. The researcher personally presented the questionnaires to individual participants in the three regional hospitals on the various dates. A higher return rate of questionnaires could be expected if personal presentation was done. The



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availability of the researcher to explain and clarify questions and answer respondents' queries helped to establish rapport and a good relationship (Polit & Hungler, 1995:288). The researcher explained the purpose and benefit of the study and informed consent forms were completed and signed by the respondents.

Data was collected during March and April 2007. Midwives who met the inclusion criteria in each hospital were given questionnaires to complete. The target sample for this study was 100 midwives.

## 3.7 DATA QUALITY

Treacy and Hyde (1999:51) state that a questionnaire is not an end in itself but a means to an end. It is an instrument that produces scores which represent a measure of the phenomenon in which the researcher is interested for the purpose of the research. In quantitative research, a major criterion for assessing the quality of data is the means of establishing the validity and reliability of the data collection instrument (Polit & Beck, 2004:428).

### 3.7.1 Validity

Validity is defined as the extent to which a study, using a particular instrument, measures what it sets out to measure (Burnard & Morrison, 1990:74). Polit & Hungler (1995:418); Monsen (1992:13) and Seaman (1987:318) refer to validity as the ability of the instrument to measure the phenomenon it intends to measure. It is concerned with the soundness and effectiveness of the measuring instrument, and whether or not an instrument measures what it sets out to measure. In this study, a competence test should measure competence and nothing else. For example, the ability of a midwife to deliver a woman on her own responsibility should measure the competence of the midwife.

Burns and Grove (2001:226) define validity as a measure of truth or falsity of the data obtained through using the research instrument. It is classified as the internal and external validity of the measuring instrument. Validity addresses the meaning or interpretation of the data produced by



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the instrument (Hanley & Belfus 2003:141). The measurement made should accurately measure the concept. In this study, the instrument has been designed to measure the competence of midwives to prevent low Apgar scores among neonates. The data obtained by the instrument actually identified the competence of midwives. A questionnaire was chosen in which respondents were requested to respond to questions posed about their knowledge, skills and ability related to the provision of antenatal and labour unit services to pregnant women. It was valid for the purpose of this study. Four aspects of validity were used to judge the accuracy of the instrument namely, face validity, content validity, criterion-related validity and construct validity (Polit & Hungler, 1995:418).

- **Face validity**

Face validity is the most obvious kind of instrument validity. It is also the weakest kind of validity measurement and merely means that the instrument appears to measure what it is supposed to measure (Brink, 2003:168). The author states that establishing face validity is the first task in establishing the accuracy of the data collection instrument. Thompson (1997:77) states that face validity is "the appropriateness of the instrument for collecting the desired information". De Vos and Fouche (1998:84) also state that face validity does not refer to what an instrument actually measures, but rather what it appears to measure. In this study the questionnaire was appropriately and logically checked and re-checked by the supervisor and joint supervisor for relevancy, lack of ambiguity and clarity. The suggestions made were implemented.

- **Content validity**

Content validity refers to how well or thoroughly the instrument measures the underlying concepts or theoretical tract. It indicates how adequate the instrument is in measuring all aspects of the concepts of interest (Hanley & Belfus, 2003:141). Cormack (2003:31) refers to content validity as being "concerned with the extent to which the instrument adequately covers the various dimensions under investigation." In this study the questionnaire identified the skills and knowledge expected of a competent midwife to prevent low Apgar scores in neonates.



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- **Criterion-related validity**

This is the degree to which the score on the instrument correlates with the external criterion believed to measure the concept under investigation (Polit & Hungler, 1995:355). Criterion-related validity assesses at what level the respondents perform according to a given measurement tool. The factors which affect positively or negatively the competence of midwives with regard to the prevention of low Apgar scores coordinated with the issues in the literature review.

### 3.7.2 Reliability

De Vos and Fouche (1998:85) and Crookes & Davies (2004:97) refer to reliability as "the extent to which independent administration of the same instrument yields the same results under comparable conditions." Monsen (1992:71) states that reliability indicates whether the results are repeatable or reproducible. Reliability can also be defined as the degree of stability, consistency, accuracy and dependability with which the instrument measures the attributes it is designed to measure (Seaman, 1987:322).

Reliability is an important precondition for validity. If an instrument is unreliable, it lacks adequate validity. If the same instrument is used several times in different situations the outcome or results will be the same. There is a relationship between reliability and validity. An instrument which is not valid cannot possibly be reliable (Polit & Hungler, 1999:250). After discussion with the promoters and the statistician about the nature of the study which included questions on which respondents could make comments, the researcher decided that the test for reliability would not be used. In ensuring reliability in this study, the same tool or instrument was used at three different hospitals and the outcome was the same in each case.



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## 3.8 DATA ANALYSIS

Data analysis is the systematic organisation and synthesis of the data and the testing of the research hypothesis using those data (Polit & Hungler, 1999:374). A statistician did the data analysis, using the Statistic Package of Social Sciences (SPSS) computer programme. The data was coded and analysed quantitatively and are presented in the form of tables in Chapter 4 of this study.

## 3.9 ETHICAL CONSIDERATIONS

Mouton (2001:240) maintains that since scientific research is a type of human conduct, it follows that the research has to correspond with the generally accepted norms and values. Nurses face ethical dilemmas in their daily duties, as do researchers, when human beings are used as study participants in a research investigation. Researchers should ensure that their rights are observed, protected and respected (Polit & Hungler, 1999:134). A far more proper, acceptable, humane and accountable approach was followed, which took the ethical responsibility to protect the rights of the research subjects into account (Burns & Grove, 2001:384). In this study the following basic ethical principles guided the researcher.

### 3.9.1 Principle of beneficence

The principle of beneficence is concerned with maximizing benefits and doing no harm (Miller & Koop, 1997:17). Pera & Van Tonder refers to beneficence as "the duty to do or promote good." It includes freedom from harm and freedom from exploitation and risk. The research study was planned and undertaken in such a manner as to avoid emotional, psychological, spiritual, moral, or any other harm that forms part of human responses (Pera & Van Tonder, 1996:23). It is very difficult to predict emotional harm that might be done to a person. In this study, the researcher received approval from the Ethics Committee of the Department of Advanced Nursing Science at the University of Venda (see Annexure A) to use a questionnaire, and treated the subjects with respect and dignity thus protecting them from emotional or psychological trauma. Psychological trauma might have resulted from the types of questions



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asked.

Any temporary discomfort identified as experienced by midwives, which might cease once the research study has been completed, was acceptable provided that permission has been obtained from participants (Basson & Uys, 1998:100). The researcher tried by all means to be mindful of participants' verbal and non-verbal cues, and tried to respond appropriately and humanely to the participants' outpourings (Seaman, 1987:23).

### 3.9.2 Principle of respect for human dignity

This principle includes the right to self-determination and the right to full disclosure. Midwives had the right to decide voluntarily to participate in the study or not without any risk of penalty or prejudicial treatment. They had the right to withdraw from the study if they felt uncomfortable, the right not to answer a specific question if they did not want to disclose that information and the right to ask for clarification if they were not sure about any aspect of the research project or any specific question (Seaman, 1987:23). Some of the questionnaires were returned incomplete and neither penalty nor prejudicial treatment was imposed on the respondents.

### 3.9.3 Principle of confidentiality

Confidentiality refers to the researcher's responsibility to refrain from sharing data gathered from respondents with outsiders (Brink, 1996:41; Brockopp & Hastings-Tolsma, 1995:173). It is the researcher's responsibility to protect data sources. In this research study, the following mechanisms were put in place to maintain confidentiality:

- Deputy Managers of the units and nursing service managers from the three selected hospitals could not gain access to the raw data of the study. The researcher kept all the completed questionnaires in her bag.
- Midwives were informed on an ongoing basis that they had the right to withhold information.
- Midwives were informed before participating in the study that the researcher did not intend to report the results of the study to the Department of Health, Limpopo Province.



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- The researcher ensured that questionnaires were locked in a safe place.

### 3.9.4 Principle of anonymity

Anonymity relates to keeping the respondents nameless in relation to their participation in the study (Brink, 2003:42; Brockopp & Hastings-Tolsma, 1995:137). In this study anonymity meant that the names of the participants would not be used. Anonymity of the respondents was protected by the following means:

- Respondents were requested not to reflect any identifying data for example, the name of self/the hospital/their address on the questionnaire.
- Raw data were entered into the computer using codes instead of names.
- Code numbers were allocated to each completed questionnaire for later review and analysis of the questionnaire.
- Data collected were analysed in groups so that the respondents could not be identified individually according to their responses.

### 3.9.5 Principle of justice

The principle of justice requires that subjects be treated equally and that the respondents should also be beneficiaries (Miller & Koop, 1997:17). Privacy was maintained throughout the study. In this study, respondents were treated equally, regardless of their level of seniority and additional qualifications. Brink (2003:48) highlights the fact that the principle includes respondents' right to fair selection and privacy. In this study the selection of the sample was done according to the pre-determined eligibility criteria (see 3.4.1).

### 3.9.6 Informed consent

Informed consent means that the participants are fully informed and understand the research project in which they are being asked to participate. In this study the researcher explained the nature and the purpose of the study before getting the participants' consent. The manner in which data would be collected and used was explained to ensure that confidentiality, anonymity and



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privacy were maintained. Written consent was thereafter obtained from midwives working in maternity units from three selected hospitals. All this was done to ensure that there was no relationship of mistrust among the participants (Earle, 1993:631).

## 3.10 PERMISSION

Ethical consideration was ensured by securing permission from

- The Ethics Committee of the Department of Advanced Nursing Science at the University of Venda.
- Research Committee, Department of Health, Limpopo Province.
- Director, District Health Services (letter requesting permission to conduct the study in three hospitals in Annexure D and letters of approval from the three selected hospitals.
- The sampled respondents from the three hospitals in Vhembe district. A covering letter explaining the study which was read and given to the respondents.

## 3.11 CONCLUSION

This chapter described the research design and methodology that was followed in this study including the population, sample and sampling, data collection procedure, data quality, data analysis, ethical considerations, permission and conclusion. Measures were adhered to in order to enhance the validity and reliability of the research results. The following chapter, Chapter 4, presents the analysis of the data obtained from the 100 questionnaires, self-administered by the midwives, to assess their competence in the prevention of low Apgar scores during March and April 2007 at three selected hospitals in Vhembe district.



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# CHAPTER 4

## ANALYSIS OF THE RESEARCH RESULTS

### 4.1 INTRODUCTION

This chapter presents an analysis of the data obtained from 95 midwives who participated anonymously by completing self-administered questionnaires. The midwives were practising in maternity units in three selected hospitals in the Vhembe region. Not all the midwives responded to all items of the questionnaire and this is reflected by "missing" written in the relevant tables and figures.

- Section A indicated the demographic data of midwives practising in maternity units in the Vhembe region.
- Section B consisted of self-assessment to determine their competency in performing midwifery skills.
- Section C assessed the knowledge of midwives in the management of women during pregnancy and labour
- Section D made provision for midwives to give their own opinion regarding the management of pregnant women by answering three open-ended questions.
- Maternity case records of 30 babies born with low Apgar scores were analysed and reports compiled.

Data was summarized mainly by computing frequencies and percentages. Various methods were used, such as the construction of frequency distribution and using tables and figures (Brink, 1999:31).



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## 4.2 DEMOGRAPHIC DATA (SECTION A)

Demographic issues which were addressed in the questionnaire included the age, gender and experience of the midwife, the maternity section currently working in, and basic and post-basic professional qualifications. Information about these aspects might be very useful for interpreting the competence of the midwives regarding the prevention of low Apgar scores among neonates. Distributions of the frequency were denoted by symbol f, percentage by % and total number of participants by n throughout this study.

**Item 1: Gender of midwives**

**Table 4.1 Gender of midwives**

| Gender | F | % |
|---|---|---|
| Female | 86 | 90.5 |
| Male | 9 | 9.5 |
| Total | 95 | 100.0 |

With reference to the above table, out of 95 midwives who participated in the study, 90.5% were female and 9.5% male. This could be explained by the fact that nursing had been a female-only profession for many years, but in becoming a progressively more modern scientific field, it had changed to a female-dominated profession. Men began to enter into the nursing profession in the late 1950s (Al-Măaita, Cameron, Horburgh & Armstrong-Stassen, 1999:16; Payne, 1999:14; http:// www.menstuff. Org/issues/by issue/nursing 07 December 2007; http:// www. Scrubs gallery. Com/men-in-nursing 06 July 2007 htm,accessed 07 December 2007). It had been reported that in South Africa, 94% of the profession were female and 6% male. This was assessed in 2003 by the South African Nursing Council (http://www.sanc. Co.za/stts/sat 2003/distribution % 202003x/s htm, 14 March 2008).

Women were participating and working towards the welfare of patients and providing them with care. The care of mothers and delivery of infants had been regarded by both patients and the medical profession as appropriately carried out by women, thus the role of midwives arose



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(http://www3. utsouth western Edu/midwifery/mdwfhistory, 07 December 2007). Men also had a positive experience working in maternity units. Proper training and development might improve their knowledge and capability, competence in managing pregnant women including the delivery of healthy babies. Midwives are the most common birth attendants in the world and the average child born into this world is born into their hands, as there are mostly females in the nursing profession (Htm/19/07/2000; http://www. Midwifery today. Com/content/view/32/30/1/5, 07 December: 2007).

**Item 2: Age of the midwives**

**Table 4.2 Age distribution of midwives**

| Age | F | % |
|---|---|---|
| 20-30 | 35 | 36.8 |
| 31-40 | 32 | 33.7 |
| 41-50 | 25 | 26.3 |
| 51-60 | 3 | 3.2 |
| Total | 95 | 100.0 |

**Table 4.2** indicates that 36.8% of the respondents were aged between 20-30 years, 33.7% between 31 and 40 years, 26.3% aged 41-50 years and 3.2% aged 51-60 years. The majority of participants (70.5%) was still below 40 years of age and was therefore expected to bring new scientific knowledge into midwifery practice. The implications of the findings might indicate that most midwives who were practising in maternity units were still young and active with knowledge from the nursing school. Only 3.2% midwives were approaching retirement age during the period of the research study. However, they could not be ignored as they were still practising in maternity units. Elderly midwives were considered to have knowledge, skills, positive attitudes, experience and were capable of providing mentorship to newly-qualified midwives.



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**Item 3: Experience as a midwife**

**Table 4.3 Distribution of experience as a midwife**

| Years of experience as a midwife | f | % |
|---|---|---|
| 0-3 years | 47 | 49.5 |
| 4-6 years | 11 | 11.6 |
| 7-9 years | 8 | 8.4 |
| 10-12 years | 12 | 12.6 |
| 13 and above | 13 | 13.7 |
| Missing | 4 | 4.2 |
| Total | 95 | 100.0 |

**Table 4.3** shows that out of 95 midwives who completed the questionnaires, 49.5% of them had 0-3 years' experience, 11.6% had 4-6 years' experience, 8% had 7-9 years' experience, 12.6% had 10-12 years' experience, 13.7% had 13 years and more experience as midwives, and 4.2% failed to respond to this question. The findings might imply that 49.5% of the midwives needed guidance and motivation from experienced midwives and 46.3% who had four years' and more experience in midwifery units may be regarded as competent due to their prolonged exposure and experience in midwifery care. A research study was carried out on 36 newly-qualified midwives who had completed their training at a particular nursing school in South Africa. The aim of the research study was to assess their level of competency following completion of their basic training as a general nurse and midwife. The findings revealed that newly-qualified midwives were not competent to perform skills for making diagnoses such as abdominal palpation to identify the lie of the fetus, presentation, position and pelvic assessment. They had little knowledge, skills, attitude and values for the assessment of a pregnant woman (Morolong & Chabeli, 2005:46).



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**Item 4: Maternity section the midwife is currently working in**

**Table 4.4 Distribution according to maternity sections currently working in**

| Section currently working | f | % |
|---|---|---|
| Antenatal clinic | 7 | 7.4 |
| Labour unit | 48 | 50.5 |
| Post-natal unit | 22 | 23.2 |
| Neonatal unit | 10 | 10.5 |
| Missing | 8 | 8.4 |
| Total | 95 | 100.0 |

**Table 4.4** shows the section where the midwives were working during the period of data collection. According to the outcome of the study, 7.4% of midwives were working in antenatal care, 50.5% indicated that they were working in the labour unit, where management of labour took place including immediate assessment of the newborn baby to rate Apgar scores at one and five minutes after birth. The post-natal section and neonatal section revealed that 23.2% and 10.5% of the midwives were working there respectively during the period of research, while 8.4% of midwives did not respond to this question. There was integration of tasks and responsibilities among the four sections. The midwives were responsible for proper monitoring of maternal and fetal wellbeing during pregnancy and labour, giving health education on preparation for labour, and cooperation and expectations to prevent low Apgar scores among neonates. Care of mother and baby continued during pueperium and more emphasis was given to future pregnancy, family planning, ante-natal care and mode of delivery with the aim of preventing low Apgar scores among neonates. Poor management of pregnant women in the maternity section might lead to poor neonatal outcome, and babies born with low Apgar scores. Midwives were expected to exercise their competencies through provision of high quality antenatal and midwifery care during labour. Competent midwives apply or utilize their knowledge and skills to facilitate an optimal experience for the woman (Fullerton, Thompson & Lacey, 2005:5)



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**Item 5: Professional basic and post-basic qualifications of midwives**

Professional nurses could be in possession of more than one area of specialisation, therefore reflecting the total in the table below was not feasible. **Table 4.5** below shows the basic and post basic qualifications for registered nurses.

**Table 4.5 Professional basic and post-basic qualifications**

| Basic and post basic qualifications | f | % |
|---|---|---|
| Registered Nurse and Midwifery | 95 | 100.0 |
| Bachelor of Arts in Nursing | 24 | 25.3 |
| Diploma in Advanced Midwifery and Neonatal Care | 10 | 10.5 |
| With no post-basic qualifications | 55 | 57.9 |
| Others, Paediatric Nursing, Theatre Technique | 6 | 6.3 |

**Table 4.5** indicates that all participants (100%) were registered nurses and midwives. Out of them, 25.3% had a Bachelor of Arts degree in Nursing, 10.5% had a Diploma in Midwifery and Neonatal Care, 57.9% had no post-basic qualifications and 6.3% had other post-basic qualifications not related to midwifery and neonatal care, for example Paediatric Nursing and Theatre Technique.

The findings revealed that 57.9% of the midwives did not have a post-basic qualification, implying that they might not have the necessary knowledge and skills for the prevention of low Apgar scores during delivery of the newborn. Advanced midwives worked closely with obstetricians in the provision of consultation and assisting the women who developed complications leading to low Apgar scores. There were fewer midwives (10.5%) who had advanced midwifery and neonatal care qualifications and this might imply that the expected competence of midwives in the prevention of low Apgar scores was not satisfactory.

The South African Nursing Council as the statutory body of the nursing profession prescribes the course of training/studies in midwifery in order to be registered as a midwife or advanced midwife. Only persons who have completed that course and have acquired the requisite



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qualifications to be registered and legally licensed to practice midwifery are regarded as midwives and allowed to practice. Midwives are held legally responsible and accountable for their practice, and Regulation R2488 stipulates the conditions under which they may carry on their midwifery profession. Guidelines for Maternity Care in South Africa also strengthen the training and roles of midwives in midwifery care. Midwives need to have acquired the knowledge and skills needed in the management of a pregnant woman during antenatal care, labour and pueperium.

## 4.3 DETERMINATION OF THE COMPETENCE OF MIDWIVES (SECTION B)

The aim of this section was to allow midwives to determine their competence in performing midwifery skills. The results were interpreted separately and some items with similar focus were clustered together for easy interpretation of their meanings. For the purpose of this study, an item was considered to be performed at competent level when it was perceived by 65% and more of the respondents.

The outcome of the research findings are indicated in **Table 4.6** below. Competent is denoted by "C", incompetent by "Inc", and missing by "Mis".



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**Table 4.6 Competence of midwives in performing midwifery skills**

| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | F | % | f | % | f | % |
| 6. taking and recording of blood pressure correctly | 53 | 55.8 | 39 | 41.1 | 3 | 3.0 | 95 | 100.0 |
| 7. plotting the partogram accurately | 88 | 92.6 | 7 | 7.4 | - | - | 95 | 100.0 |
| 8. monitoring the strength of uterine contractions | 91 | 95.8 | 4 | 4.2 | - | - | 95 | 100.0 |
| 9. monitoring fetal heart using the fetal scope | 95 | 100.0 | - | - | - | - | 95 | 100.0 |
| 10. monitoring of fetal heart using electric fetal monitor | 89 | 93.7 | 6 | 6.3 | - | - | 95 | 100.0 |
| 11. performing internal examination during labour | 85 | 89.5 | 9 | 9.5 | 1 | 1.1 | 95 | 100.0 |
| 12. performing pelvic assessment during labour | 71 | 74.7 | 23 | 24.2 | 1 | 1.1 | 95 | 100.0 |
| 13. interpreting any deviations from cardiotocograph | 53 | 55.8 | 40 | 42.1 | 2 | 2.1 | 95 | 100.0 |
| 14. detecting the condition of the cervix during labour | 88 | 92.6 | 6 | 6.3 | 1 | 1.1 | 95 | 100.0 |
| 15. detecting the presence of moulding during labour | 85 | 89.5 | 9 | 9.5 | 1 | 1.1 | 95 | 100.0 |
| 16. detecting the presence of caput during labour | 90 | 94.7 | 5 | 5.3 | - | - | 95 | 100.0 |
| 17. detecting the larger diameters of fetal skull in a deflexed head | 53 | 55.8 | 39 | 41.1 | 3 | 3.2 | 95 | 100.0 |
| | | | | | | | | |



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| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | F | % | f | % | f | % |
| 18. delivering the woman during the second stage of labour | 91 | 95.8 | 3 | 3.2 | 1 | 1.1 | 95 | 100.0 |
| 19. delivering breech presentation | 54 | 56.8 | 41 | 43.2 | - | - | 95 | 100.0 |
| 20. performing vacuum extraction | 9 | 9.5 | 86 | 90.5 | - | - | 95 | 100.0 |
| 21. performing midwifery forceps delivery | 8 | 8.4 | 86 | 90.5 | 1 | 1.1 | 95 | 100.0 |
| 22. resuscitating a newborn baby | 84 | 88.4 | 11 | 11.6 | - | - | 95 | 100.0 |
| 23. managing the woman on trial of scar in labour | 68 | 71.6 | 23 | 24.2 | 4 | 4.2 | 95 | 100.0 |
| 24. palpating pregnant woman to diagnose posterior position | 79 | 83.2 | 16 | 17.8 | - | - | 95 | 100.0 |
| 25. delivering shoulder dystocia during second stage of labour | 50 | 52.6 | 43 | 45.3 | 2 | 2.1 | 95 | 100.0 |
| 26. locating the fetal position through abdominal palpation | 94 | 98.9 | 1 | 1.1 | - | - | 95 | 100.0 |
| 27. estimating fetal weight through abdominal palpation | 85 | 89.5 | 10 | 10.5 | - | - | 95 | 100.0 |
| 28. detecting the engagement of fetal head at 38-39 weeks in primigravida | 89 | 93.7 | 6 | 6.3 | - | - | 95 | 100.0 |
| 29. performing fundal palpation to a pregnant woman | 94 | 98.9 | 1 | 1.1 | - | - | 95 | 100.0 |
| 30. performing lateral palpation to a pregnant woman | 88 | 92.6 | 7 | 7.4 | - | - | 95 | 100.0 |



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| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | F | % | f | % | f | % |
| | | | | | | | | |
| 31. performing pelvic palpation to a pregnant woman | 77 | 81.1 | 18 | 18.9 | - | - | 95 | 100.0 |
| 32. performing pawlik's grip to a pregnant woman | 74 | 77.9 | 21 | 22.1 | - | - | 95 | 100.0 |
| 33. measuring height of fundus by abdominal palpation | 94 | 98.9 | 1 | 1.1 | - | - | 95 | 100.0 |
| 34. performing pelvic assessment at 34-36weeks of pregnancy to exclude pelvic inadequacy | 70 | 73.7 | 23 | 24.2 | 2 | 2.1 | 95 | 100.0 |
| 35cutting an episiotomy during the second stage of labour | 90 | 94.7 | 4 | 4.2 | 1 | 1.1 | 95 | 100.0 |
| 36. delivering tight cord around the neck | 79 | 83.2 | 16 | 16.8 | - | - | 95 | 100.0 |
| 37. detecting cord presentation during internal examination | 80 | 84.2 | 15 | 15.8 | - | - | 95 | 100.0 |
| 38. taking action in case of continuous strong contractions | 73 | 76.8 | 19 | 20.0 | 3 | 3.2 | 95 | 100.0 |
| 39. detecting signs of early and late deceleration | 75 | 78.9 | 19 | 20.0 | - | - | 95 | 100.0 |
| 40. taking immediate action in case of fetal distress | 93 | 97.9 | 2 | 2.1 | - | - | 95 | 100.0 |
| 41. taking action in case of delayed second stage of labour | 91 | 95.8 | 4 | 4.2 | - | - | 95 | 100.0 |
| 42. identifying meconium-stained liquor grade 1, 2 or 3 | 88 | 92.6 | 7 | 7.4 | - | - | 95 | 100.0 |



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| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | F | % | f | % | f | % |
| 43. carrying out measures in case of meconium-stained liquor | 83 | 87.4 | 12 | 12.6 | - | - | 95 | 100.0 |
| 44. carrying out measures in case of caput 2++ | 59 | 62.1 | 34 | 35.8 | 2 | 2.1 | 95 | 100.0 |
| 45. diagnosing early signs of pregnancy-induced hypertension | 86 | 90.5 | 9 | 9.5 | - | - | 95 | 100.0 |
| 46. diagnosing gestational diabetes mellitus | 74 | 77.9 | 20 | 21.1 | 1 | 1.1 | 95 | 100.0 |
| 47. managing pregnancy-induced hypertension | 80 | 84.2 | 15 | 15.8 | - | - | 95 | 100.0 |
| 48. managing diabetes mellitus during pregnancy | 73 | 76.8 | 22 | 23.2 | - | - | 95 | 100.0 |
| 49. managing antepartum hemorrhage | 82 | 86.3 | 13 | 13.7 | - | - | 95 | 100.0 |
| 50. managing premature labour | 83 | 87.4 | 12 | 12.6 | - | - | 95 | 100.0 |
| 51. managing grandemultipara woman till delivery | 89 | 93.7 | 6 | 6.3 | - | - | 95 | 100.0 |
| 52. managing premature rupture of membranes | 88 | 92.6 | 6 | 6.3 | 1 | 1.1 | 95 | 100.0 |
| 53. managing the effect of pethidine on the baby | 42 | 44.2 | 53 | 55.8 | - | - | 95 | 100.0 |
| 54. interpreting any deviations from the partogram | 81 | 85.3 | 14 | 14.7 | - | - | 95 | 100.0 |
| 55. taking action in case the woman crossed the action line | 85 | 89.5 | 10 | 10.5 | - | - | 95 | 100.0 |
| 56. managing cord presentation | 84 | 88.4 | 11 | 11.6 | - | - | 95 | 100.0 |
| 57. assisting the doctor when performing vacuum extraction | 62 | 65.2 | 36 | 37.9 | 1 | 1.1 | 95 | 100.0 |



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**In table 4.7,** items 6, 7, 8, 9, and 10 were clustered, communicated and interpreted together as competencies related to the monitoring of fetal condition and progress of labour.

**Table 4.7 Monitoring of fetal condition and progress of labour**

| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| 6. taking and recording of blood pressure correctly | 53 | 55.8 | 39 | 41.1 | 3 | 3.0 | 95 | 100.0 |
| 7. plotting the partogram accurately | 88 | 92.6 | 7 | 7.4 | - | - | 95 | 100.0 |
| 8. monitoring strength of uterine contractions | 91 | 95.8 | 4 | 4.2 | - | - | 95 | 100.0 |
| 9. monitoring fetal heart using the fetal scope | 95 | 100.0 | - | - | - | - | 95 | 100.0 |
| 10. monitoring of fetal heart using electric fetal monitor | 89 | 93.7 | 6 | 6.3 | - | - | 95 | 100.0 |

**Item 6** indicated that 55.8% and 41.1% of the midwives perceived themselves to be competent and incompetent respectively in taking and recording blood pressure correctly, and 3.2% midwives did not respond to this question. **Item 7** indicated that 92.6% of the midwives perceived themselves to be competent in plotting the partogram whereas 7.4% perceived themselves to be incompetent. In **item 8,** 95.8% and 4.2% of the midwives perceived themselves to be competent and incompetent respectively in monitoring the uterine contraction during labour. **Item 9** indicated that all the midwives perceived themselves to be competent in monitoring the fetal heart using a fetal scope whereas in **item 10,** 93.7% and 6.3% of the midwives perceived themselves to be competent and incompetent respectively in monitoring the fetal heart using an electric fetal monitor. The findings conclude that the midwives perceived themselves to be competent in plotting the partogram accurately, monitoring the strength of uterine contractions, monitoring of the fetal heart using a fetal scope and monitoring the fetal heart using an electric monitor, but they were incompetent in taking and recording blood pressure



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correctly.

**In table 4.8, items 11, 12, 14, 15, 16, 17 and 37** were clustered, communicated and interpreted as competencies related to assessing and performing vaginal examination in a pregnant woman during labour.

**Table 4.8 Assessment and performing vaginal examination**

| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| 11. performing vaginal examination during labour | 85 | 89.5 | 9 | 9.5 | 1 | 1.1 | 95 | 100.0 |
| 12. performing pelvic assessment during labour | 71 | 74.7 | 23 | 24.2 | 1 | 1.1 | 95 | 100.0 |
| 14. detecting the condition of the cervix during labour | 88 | 92.6 | 6 | 6.3 | 1 | 1.1 | 95 | 100.0 |
| 15. detecting the presence of moulding during labour | 85 | 89.5 | 9 | 9.5 | 1 | 1.1 | 95 | 100.0 |
| 16. detecting the presence of caput during labour | 90 | 94.7 | 5 | 5.3 | - | - | 95 | 100.0 |
| 17. detecting the larger diameters of fetal skull in a deflexed head | 53 | 55.8 | 39 | 41.1 | 3 | 3.2 | 95 | 100.0 |
| 37. detecting cord presentation during internal examination | 80 | 84.2 | 15 | 15.8 | - | - | 95 | 100.0 |

**Item 11** indicated that 89.5% and 9.5% of the midwives perceived themselves to be competent and incompetent respectively in performing vaginal examination and 1.1% did not respond to the statement. **Item 12** indicated that 74.7% and 24.2% of the midwives perceived themselves to be competent and incompetent respectively in performing pelvic assessment during labour, while



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1.1% of the midwives did not respond to the statement. Regarding **Item 14**, out of 95 midwives, 92.6% and 6.3% of the midwives perceived themselves to be competent and incompetent respectively in detecting the condition of the cervix during labour, while 1.1% did not respond to this statement. **Item 15** indicated that 89.5% and 9.5% of the midwives perceived themselves to be competent and incompetent respectively in detecting the presence of moulding, but 1.1% of the midwives did not respond to this statement. **Item 16** indicated that 94.7% and 5.3% of the midwives perceived themselves to be competent and incompetent respectively in detecting the presence of caput during labour. **Item 17** showed that 55.8% and 41.1% of the midwives perceived themselves to be competent and incompetent respectively in detecting the larger diameters of fetal skull in a deflexed head while 3.2% of the midwives did not respond to this statement. **Item 37** indicated that 84.2% and 15.8% of the midwives perceived themselves to be competent and incompetent respectively in detecting the cord around the neck during internal examination.

The findings concluded that the midwives perceived themselves to be competent in the following six skills: performing vaginal examination during labour, performing pelvic assessment during labour, detecting the condition of the cervix during labour, detecting the presence of moulding during labour, detecting the presence of caput during labour and detecting cord presentation during internal examination. However they were incompetent in one skill, which was detecting the larger diameters in a deflexed head.



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**In Table 4.9, items 18, 19, 20, 21, 25, 35, 36 and 57** were clustered, communicated and interpreted as competencies related to delivery of the baby.

**Table 4.9 Delivery of the baby**

| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | F | % | f | % | f | % | f | % |
| 18. delivering the woman during the second stage of labour | 91 | 95.8 | 3 | 3.2 | 1 | 1.1 | 95 | 100.0 |
| 19. delivering breech presentation | 54 | 56.8 | 41 | 43.2 | - | - | 95 | 100.0 |
| 20. performing vacuum extraction | 9 | 9.5 | 86 | 90.5 | - | - | 95 | 100.0 |
| 21. performing midwifery forceps delivery | 8 | 8.4 | 86 | 90.5 | 1 | 1.1 | 95 | 100.0 |
| 25. delivering shoulder dystocia during second stage of labour | 50 | 52.6 | 43 | 45.3 | 2 | 2.1 | 95 | 100.0 |
| 35. cutting for an episiotomy during the second stage of labour | 90 | 94.7 | 4 | 4.2 | 1 | 1.1 | 95 | 100.0 |
| 36. delivering with a tight cord around the neck | 79 | 83.2 | 16 | 16.8 | - | - | 95 | 100.0 |
| 57. assisting the doctor during vacuum extraction | 62 | 65.2 | 36 | 37.9 | 1 | 1.1 | 95 | 100.0 |
| 22. resuscitating a newborn baby | 84 | 88.4 | 11 | 11.6 | - | - | 95 | 100.0 |

**Item 18** indicated that 95.8% and 3.2% of the midwives perceived themselves to be competent and incompetent respectively in delivering the woman during the second stage of labour, while



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1.1% of the midwives did not respond to this statement. **Item 19** indicated that 56.8% and 43.2% of the midwives perceived themselves to be competent and incompetent respectively in delivering with a breech presentation. **Item 20** indicated that 9.5% and 90.5% of the midwives perceived themselves to be competent and incompetent respectively in performing vacuum extraction. **Item 21** indicated that 8.4% and 90.5% of the midwives perceived themselves to be competent and incompetent respectively in performing forceps delivery, while 1.1% of the midwives did not respond to this statement. **Item 22** indicated that 88.4% and 11.6% of the midwives perceived themselves to be competent and incompetent respectively in the resuscitation of a newborn baby. **Item 25** indicated that 52.6% and 45.3% of the midwives perceived themselves to be competent and incompetent respectively in delivering shoulder dystocia, while 2.1% of the midwives did not respond to this statement. **Item 35** indicated that 94.7% and 4.2% of the midwives perceived themselves to be competent and incompetent respectively in cutting for the episiotomy, while 1.1% did not respond to this statement. **Item 36** indicated that 83.2% and 16.7% of the midwives perceived themselves to be competent and incompetent respectively in delivering with a tight cord around the neck. **Item 57** indicated that 65.2% and 37.9% of the midwives perceived themselves to be competent and incompetent respectively in assisting the doctor during vacuum extraction, but 1.1% did not respond to this statement.

The findings concluded that the midwives perceived themselves to be competent in the following three skills: delivering the woman during the second stage of labour, cutting for an episiotomy during the second stage of labour and delivering with a tight cord around the neck. They were incompetent in performing the following five skills: delivering with breech presentation, performing vacuum extraction, performing midwifery forceps delivery, delivering shoulder dystocia during second stage of labour and assisting the doctor during vacuum extraction.

**Table 4.10, items 24, 26, 27, 28, 29, 30, 31, 32, 33 and 34** were clustered, communicated and interpreted together under the competencies related to assessment and abdominal palpation of a pregnant woman.



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**Table 4.10 Assessment and abdominal palpation of a pregnant woman**

| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | F | % |
| 24. palpating pregnant woman to diagnose posterior position | 79 | 83.2 | 16 | 17.8 | - | - | 95 | 100.0 |
| 26. locating the fetal position through abdominal palpation | 94 | 98.9 | 1 | 1.1 | - | - | 95 | 100.0 |
| 27. estimating fetal weight through abdominal palpation | 85 | 89.5 | 10 | 10.5 | - | - | 95 | 100.0 |
| 28. detecting the engagement of fetal head at 38-39 weeks in primigravida | 89 | 93.7 | 6 | 6.3 | - | - | 95 | 100.0 |
| 29. performing fundal palpation to a pregnant woman | 94 | 98.9 | 1 | 1.1 | - | - | 95 | 100.0 |
| 30. performing lateral palpation to a pregnant woman | 88 | 92.6 | 7 | 7.4 | - | - | 95 | 100.0 |
| 31. performing pelvic palpation to a pregnant woman | 77 | 81.1 | 18 | 18.9 | - | - | 95 | 100.0 |
| 32. performing Pawlik's grip to a pregnant woman | 74 | 77.9 | 21 | 22.1 | - | - | 95 | 100.0 |
| 33. measuring height of fundus by abdominal palpation | 94 | 98.9 | 1 | 1.1 | - | - | 95 | 100.0 |
| 34. performing pelvic assessment at 34-36 weeks of pregnancy to exclude pelvic inadequacy | 70 | 73.7 | 23 | 24.2 | 2 | 2.1 | 95 | 100.0 |

**Item 24** indicated that 83.2% and 16.8% of the midwives perceived themselves to be competent and incompetent respectively in abdominal palpation to diagnose posterior position. **Item 26** indicated that 98.9% and 1.1% of the midwives perceived themselves to be competent and



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incompetent respectively in performing abdominal palpation to locate fetal position. **Item 27** indicated that 89.5% and 10.5% of the midwives perceived themselves to be competent and incompetent respectively in estimating the fetal weight during antenatal care through abdominal palpation. **Item 28** indicated that 93.7% and 6.3% of the midwives perceived themselves to be competent and incompetent respectively in engagement of the fetal head at 38-39 weeks of pregnancy. **Item 29** indicated that 98.9% and 1.1% of the midwives perceived themselves to be competent and incompetent respectively in performing fundal palpation. **Item 30** indicated that 92.6% and 7.4% of the midwives perceived themselves to be competent and incompetent respectively in performing lateral palpation. **Item 31** indicated that 81.1% and 18.9% of the midwives perceived themselves to be competent and incompetent in performing pelvic palpation. **Item 32** indicated that 77.9% and 22.1% of the midwives perceived themselves to be competent and incompetent respectively in performing Pawlik's grip. **Item 33** indicated that 98.9% and 1.1% of the midwives perceived themselves to be competent and incompetent respectively in measuring of fundal height. **Item 34** indicated that 73.7% and 24.2% of the midwives perceived themselves to be competent and incompetent respectively in performing pelvic assessment at 34-36 weeks of pregnancy, while 2.1% of the midwives did not respond to this statement. The findings concluded that midwives were competent in all skills related to assessment and abdominal palpation of a pregnant woman.

**In Table 4.11, items 13, 23, 38, 39, 40, 41, 42, 43, 44, 54 and 55** were clustered, communicated and interpreted together under the competencies related to monitoring and taking of immediate action during progress of labour.



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**Table 4.11 Monitoring and immediate action during progress of labour**

| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | F | % |
| 13. interpreting any deviations from cardiotocograph | 53 | 55.8 | 40 | 42.1 | 2 | 2.1 | 95 | 100.0 |
| 23. managing the woman on trial of scar in labour | 68 | 71.6 | 23 | 24.2 | 4 | 4.2 | 95 | 100.0 |
| 38. taking actions in case of continuous strong contractions | 73 | 76.8 | 19 | 20.0 | 3 | 3.2 | 95 | 100.0 |
| 39. detecting signs of early and late deceleration | 75 | 78.9 | 19 | 20.0 | - | - | 95 | 100.0 |
| 40. taking immediate action in case of fetal distress | 93 | 97.9 | 2 | 2.1 | - | - | 95 | 100.0 |
| 41. taking action in case of delayed second stage of labour | 91 | 95.8 | 4 | 4.2 | - | - | 95 | 100.0 |
| 42. identifying meconium stained liquor grade 1, 2 or 3 | 88 | 92.6 | 7 | 7.4 | - | - | 95 | 100.0 |
| 43. carrying out measures in case of meconium stained liquor | 83 | 87.4 | 12 | 12.6 | - | - | 95 | 100.0 |
| 44. interpreting any deviations from cardiotocograph | 59 | 62.1 | 34 | 35.8 | 2 | 2.1 | 95 | 100.0 |
| 54. interpreting any deviations from the partogram | 81 | 85.3 | 14 | 14.7 | - | - | 95 | 100.0 |
| 55. taking action in case the woman crossed the action line | 85 | 89.5 | 10 | 10.5 | - | - | 95 | 100.0 |

**Item 13** indicated that 55.8% and 42.1% of the midwives perceived themselves to be competent and incompetent respectively in interpreting any deviations from the cardiotocograph while 2.1% of the midwives did not respond to this statement. **Item 23** indicated that 71.6% and 24.2% of the



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midwives perceived themselves to be competent and incompetent respectively in managing the woman on trial of scar (woman who had previously delivered by caesarian section), while 4.2% midwives did not respond to this statement. **Item 38** indicated that 76.7% and 20.0% of the midwives perceived themselves to be competent and incompetent respectively in taking action in case of continuous strong contractions, while 2% of the midwives did not respond to this statement. **Item 39** indicated that 78.9% and 20.0% of the midwives perceived themselves to be competent and incompetent respectively in detecting signs of early and late deceleration and 1.1% did not respond to this statement. **Item 40** indicated that 97.9% and 2.1% of the midwives perceived themselves to be competent and incompetent respectively in taking immediate action in case of fetal distress. **Item 41** indicated that 95.8% and 4.2% of the midwives perceived themselves to be competent and incompetent respectively in taking action in case of delayed second stage of labour. **Item 42** indicated that 92.6% and 7.4% of the midwives perceived themselves to be competent and incompetent respectively in identifying meconium-stained liquor grade 1, 2 and 3**. Item 43** indicated that 87.4% and 12.6% midwives perceived themselves to be competent and incompetent respectively in carrying out measures in case of meconium-stained liquor. **Item 44** indicated that 62.1% and 35.8% of the midwives perceived themselves to be competent and incompetent respectively in carrying out measures in case of caput 2++, but 2.1% did not respond to this statement. **Item 55** indicated that 89.5% and 10.5% of the midwives perceived themselves to be competent and incompetent respectively in taking action in case the woman crossed the action line. The findings concluded that midwives were competent in performing the following eight skills: managing the woman on trial of scar in labour, taking action in case of continuous strong contractions, detecting signs of early and late deceleration, taking immediate action in case of fetal distress, taking action in case of delayed second stage of labour, identifying meconium-stained liquor grade 1, interpreting any deviations from the partogram and taking action in case the woman crossed the action line. Midwives were incompetent in performing the following two skills: interpreting any deviations from the cardiotocograph (Item 13) and interpreting any deviations from cardiotocograph (Item 44).

**In Table 4.12, items 45, 46, 47, 48, 49, 50, 51 and 52** were clustered, communicated and interpreted together under the competencies related to diagnosing and managing high risk conditions during pregnancy and labour.



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**Table 4.12 Diagnosing and management of high risk conditions**

| I am competent in | C | | Inc | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | F | % |
| 45. diagnosing early signs of pregnancy-induced hypertension | 86 | 90.5 | 9 | 9.5 | - | - | 95 | 100.0 |
| 46. diagnosing gestational diabetes mellitus | 74 | 77.9 | 20 | 21.1 | 1 | 1.1 | 95 | 100.0 |
| 47. managing pregnancy-induced hypertension | 80 | 84.2 | 15 | 15.8 | - | - | 95 | 100.0 |
| 48. managing diabetes mellitus during pregnancy | 73 | 76.8 | 22 | 23.2 | - | - | 95 | 100.0 |
| 49. managing antepartum hemorrhage | 82 | 86.3 | 13 | 13.7 | - | - | 95 | 100.0 |
| 50. managing premature labour | 83 | 87.4 | 12 | 12.6 | - | - | 95 | 100.0 |
| 51. managing multiparous woman till delivery | 89 | 93.7 | 6 | 6.3 | - | - | 95 | 100.0 |
| 52. managing premature rupture of membranes | 88 | 92.6 | 6 | 6.3 | 1 | 1.1 | 95 | 100.0 |
| 56. managing cord presentation | 84 | 88.4 | 11 | 11.6 | - | - | 95 | 100.0 |

**Item 45** indicated that 90.5% and 9.5% of the midwives perceived themselves to be competent and incompetent respectively in diagnosing early signs of pregnancy-induced hypertension. **Item 46** indicated that 77.9% and 21.1% of the midwives perceived themselves to be competent and incompetent respectively in diagnosing gestational diabetes mellitus and 1.1% failed to respond to this statement. **Item 47** indicated that 84.2% and 15.8% of the midwives perceived themselves to be competent and incompetent respectively in the management of pregnancy-induced hypertension. **Item 48** indicated that 76.8% and 23.2% of the midwives perceived themselves to be competent and incompetent respectively in the management of diabetes mellitus. **Item 49**



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indicated that 86.3% and 13.7% of midwives perceived themselves to be competent and incompetent respectively in management of antepartum hemorrhage. **Item 50** indicated that 87.4% and 12.6% of the midwives perceived themselves to be competent and incompetent respectively in management of premature labour. **Item 51** indicated that 93.7% and 6.3% of the midwives perceived themselves to be competent and incompetent respectively in the management of grandemultipara. **Item 52** indicated that 92.6% and 6.3% of the midwives perceived themselves to be competent and incompetent respectively in managing the premature rupture of membrane, and 1.1% of midwives did not respond to this statement. **Item 56** indicated that 88.4% and 11.6% of the midwives perceived themselves to be competent and incompetent respectively in managing cord presentation. The findings might conclude that midwives were competent in all skills related to making diagnoses and management of high risk conditions.

**Item 53: Managing the effect of pethidine on the baby**

**Item 53** indicated that 44.2% and 55.8% midwives perceived themselves to be competent and incompetent respectively in managing the effect of pethidine on the baby. The findings might conclude that midwives were not competent in the management of the effect of pethidine on babies.

This section revealed that midwives perceived themselves to be competent in many but not necessarily all midwifery skills outlined in the questionnaire. According to Kime (1992:41), pregnancy, labour and childbirth are normal bodily processes that are uncomplicated when a woman receives skilled medical and emotional support by competent midwives. The Guidelines of Maternity Care in South Africa are developed to give guidance to midwives in providing midwifery care services in the clinics, health centres and district hospitals where specialist obstetricians are not normally available. It also gives clear directions about the roles of midwives in managing a pregnant woman during pregnancy, labour and pueperium in accordance with the standards set at primary and secondary levels. The South African Nursing Council also stipulates the rules and regulations (R2488) which indicates the conditions under which midwives may carry on their profession and carry out midwifery care on a pregnant woman. Midwives should be competent in performing midwifery skills such as abdominal palpation of a pregnant woman,



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taking and recording of blood pressure correctly, monitoring of fetal condition using a fetal scope or cardiotocograph, internal examination during labour, conducting delivery on her own and the rest as discussed in this study.

## 4.4 SELF-ASSESSMENT OF KNOWLEDGE OF MIDWIVES (SECTION C)

According to Myles *et al.* (2004:5) and Mashanzi (2000:199), a midwife refers to any person registered as a midwife with the South African Interim Nursing Council and who has been trained to assess and make a decision to a save life. The goal of the teaching and learning process for midwives is to acquire knowledge, demonstrate critical thinking ability and demonstrate competency in performing clinical skills (Fullerton & Ingle, 2003:429). Knowledge is the prerequisite for proper management of the woman during antenatal care and labour.

This section was intended to assess the knowledge of midwives in the management process of a woman during pregnancy and labour. Respondents were asked to rate their knowledge on the scale below. Items of the same meaning were clustered together for easy interpretation of the results. "Strongly agree" and "agree" were combined to denote "agree"; "disagree" and "strongly disagree" were combined to denote "disagree" and missing responses by "mis".



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**Table 4.13 Competence related to knowledge acquired by midwives**

| Knowledge of the midwives | Agree | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| 58. During palpation the palmar surfaces of the fingers determine the soft consistency of the fetus | 61 | 64.3 | 28 | 29.5 | 6 | 6.3 | 95 | 100.0 |
| 59. Walking the fingertips of both hands is an excellent method of locating fetal position | 65 | 68.4 | 25 | 26.3 | 5 | 5.3 | 95 | 100.0 |
| 60. Recurrent pregnancies lead to poor fetal growth | 53 | 55.4 | 38 | 40.0 | 4 | 4.2 | 95 | 100.0 |
| 61. Thick and tight cervix facilitates good progress of labour | 11 | 11.6 | 84 | 88.4 | - | - | 95 | 100.0 |
| 62. The hands grasp the fetal mass in the centre to assess the fetal weight and size | 47 | 49.4 | 42 | 44.3 | 6 | 6.3 | 95 | 100.0 |
| 63. Meconium-stained liquor is an indication of amniotitis | 32 | 32.7 | 60 | 64.1 | 3 | 3.2 | 95 | 100.0 |
| 64. In primigravida the head should have engaged at 38-39 weeks of pregnancy | 60 | 63.2 | 33 | 35.7 | 2 | 2.1 | 95 | 100.0 |
| 65. Posterior position of the fetus leads to prolonged labour | 74 | 77.9 | 21 | 22.1 | - | - | 95 | 100.0 |
| 66. Resuscitation of a newborn requires extra skills and experience | 82 | 86.3 | 13 | 13.7 | - | - | 95 | 100.0 |
| 67. Presence of moulding 3+ is a good indication of descent of the head during labour | 18 | 19.0 | 77 | 81.0 | - | - | 95 | 100.0 |
| | | | | | | | | |



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| Knowledge of the midwives | Agree | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| 68. Continuous strong contractions may lead to rupture of the uterus | 80 | 84.2 | 15 | 15.8 | - | - | 95 | 100.0 |
| 69. In multiparous women duration of second stage of labour should not exceed 30 minutes | 66 | 69.5 | 29 | 30.5 | - | - | 95 | 100.0 |
| 70. Fetal heart rate is monitored ¼-hourly during the active phase of labour | 57 | 60.0 | 38 | 40.0 | - | - | 95 | 100.0 |
| 71. Pelvic assessment is done at 34-36 weeks of pregnancy in primigravida | 66 | 69.5 | 29 | 30.6 | - | - | 95 | 100.0 |
| 72. Full urinary bladder facilitates descent of the fetal head during labour | 16 | 16.8 | 77 | 81.1 | 2 | 2.1 | 95 | 100.0 |
| 73. A rise in blood pressure of 160/100 during the second trimester is considered pathological and needs advice for rest | 62 | 65.2 | 32 | 33.7 | 1 | 1.1 | 95 | 100.0 |
| 74. Diabetes mellitus during pregnancy may cause obese babies leading to difficult delivery | 86 | 90.5 | 8 | 8.4 | 1 | 1.1 | 95 | 100.0 |
| 75. Maternal condition is recorded on the partogram | 80 | 84.2 | 13 | 13.7 | 2 | 2.1 | 95 | 100.0 |
| 76. PIH causes decrease in uterine blood flow and placental dysfunction if not treated properly | 70 | 73.7 | 21 | 22.1 | 4 | 4.2 | 95 | 100.0 |



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| Knowledge of the midwives | Agree | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| 77. Descent of the fetal head takes place in deflexed head | 32 | 33.6 | 56 | 58.9 | 7 | 7.4 | 95 | 100.0 |
| 78. Antepartum haemorrhage, prolonged labour and premature labour are conditions that compromise the fetus | 68 | 71.6 | 26 | 27.4 | 1 | 1.1 | 95 | 100.0 |
| 79. Vacuum extraction is the best in the case of delayed second stage of labour | 42 | 44.2 | 52 | 54.7 | 1 | 1.1 | 95 | 100.0 |
| 80. Bishop score of "6" is a good indication of induction at 42 weeks of pregnancy | 50 | 52.6 | 40 | 42.1 | 5 | 5.3 | 95 | 100.0 |

**Items 58, 59 and 62** were clustered, communicated and interpreted together under the acquisition of knowledge regarding performance of abdominal palpation of a pregnant woman.

**Table 4.14 Abdominal palpation**

| Knowledge of the midwives | Agee | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| 58. During palpation the palmar surfaces of the fingers determine the soft consistency of the fetus | 61 | 64.3 | 28 | 29.5 | 6 | 6.3 | 95 | 100.0 |
| 59. Walking the fingertips of both hands is an excellent method of locating fetal position | 65 | 68.4 | 25 | 26.3 | 5 | 5.3 | 95 | 100.0 |
| 62. The hands grasp the fetal mass in the centre to assess the fetal weight and size | 47 | 49.4 | 42 | 44.3 | 6 | 6.3 | 95 | 100.0 |

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**Item 58** indicated that 64.3% of midwives agreed and 29.5% disagreed with the statement that during palpation the palmar surfaces of the fingers determine the soft consistency of the fetus, while 6.3% of the midwives did not respond to the statement. **Item 59** indicated that 68.4% of the midwives agreed and 26.3% disagreed with the statement that walking the fingertips of both hands is an excellent method of locating fetal position, while 6.3% did not respond to the statement. **Item 62** indicated that 49.4% of the midwives agreed and 44.3% of the midwives disagreed with the statement that the hands grasped the fetal mass in the centre to assess the fetal weight and size, while 6.3% did not respond to this statement.

The findings might conclude that midwives had knowledge on one skill that walking the fingertips of both hands was an excellent method of locating fetal position, and they lacked knowledge of the following two skills: "During palpation the palmar surfaces of the fingers determine the soft consistency of the fetus", and "The hands grasp the fetal mass in the centre to assess the fetal weight".

**Items 60, 64 and 73** were clustered, communicated and interpreted together under the acquisition of knowledge regarding the identification of the outcomes of pregnancy.

**Table 4.15 Outcomes of pregnancy**

| Knowledge of the midwives | Agee | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | F | % | f | % |
| 60. Recurrent pregnancies lead to poor fetal growth | 53 | 55.4 | 38 | 40.0 | 4 | 4.2 | 95 | 100.0 |
| 64. In primigravida the head should have engaged at 38-39 weeks of pregnancy | 60 | 63.2 | 33 | 35.7 | 2 | 2.1 | 95 | 100.0 |
| 73. A rise in blood pressure of 160/100 during the second trimester is considered pathological and needs advice | 62 | 65.2 | 32 | 33.7 | 1 | 1.1 | 95 | 100.0 |



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| for rest | | | | | | | | |
|---|---|---|---|---|---|---|---|---|

**Item 60** indicated that 55.4% of the midwives agreed and 40.4% disagreed with the statement that recurrent pregnancies lead to poor fetal growth, while 4.2% did not respond to this statement. **Item 64** indicated that 63.2% of the midwives agreed and 35.7% disagreed with the statement that in primigravida the head should have engaged at 38-39 weeks of pregnancy, while 2.1% did not respond to the statement. **Item 73** indicated that 65.2% of the midwives agreed and 33.5% disagreed with the statement that a rise in blood pressure of 160/100 in the second trimester is pathological and needs advice for rest, but 1.1% did not respond to this statement. The findings might conclude that midwives know that "A rise in blood pressure of 160/100 during the second trimester is considered pathological and needs advice for rest", and they lack knowledge on the following two skills: "Recurrent pregnancies lead to poor fetal growth" and "In primigravida the head should have engaged at 38-39 weeks of pregnancy".

**Items 61, 63, 64, 65, 67, 68, 71, 72,** 77 and **80** were clustered, communicated and interpreted together under the acquisition of knowledge regarding interpretation of the findings during pregnancy and labour.

**Table 4.16 Interpretations of findings in pregnancy and labour**

| Knowledge of the midwives | Agee | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | F | % | f | % |
| 61. A thick and tight cervix facilitates good progress of labour | 11 | 11.6 | 84 | 88.4 | - | - | 95 | 100.0 |
| 63. Meconium-stained liquor is an indication of amniotitis | 32 | 32.7 | 60 | 64.1 | 3 | 3.2 | 95 | 100.0 |
| 64. In primigravida the head should have engaged at 38-39 weeks of pregnancy | 60 | 63.2 | 33 | 35.7 | 2 | 2.1 | 95 | 100.0 |
| 65. Posterior position of the fetus leads to prolonged labour | 74 | 77.9 | 21 | 22.1 | - | - | 95 | 100.0 |



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| Knowledge of the midwives | Agee | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | F | % | f | % |
| 67. Presence of moulding 3+ is a good indication of descent of the head during labour | 18 | 19.0 | 77 | 81.0 | - | - | 95 | 100.0 |
| 68. Continuous strong contractions may lead to rupture of the uterus | 80 | 84.2 | 15 | 15.8 | - | - | 95 | 100.0 |
| 71. Pelvic assessment is done at 34-36 weeks of pregnancy in primigravida | 66 | 69.5 | 29 | 30.6 | - | - | 95 | 100.0 |
| 72. Full urinary bladder facilitates descent of the fetal head during labour | 16 | 16.8 | 77 | 81.1 | 2 | 2.1 | 95 | 100.0 |
| 77. Descent of the fetal head takes place in deflexed head | 32 | 33.6 | 56 | 58.9 | 7 | 7.4 | 95 | 100.0 |
| 80. Bishop score of "6" is a good indication of induction at 42 weeks of pregnancy | 50 | 52.6 | 40 | 42.1 | 5 | 5.3 | 95 | 100.0 |

**Item 61** indicated that 11.6% of the midwives agreed and 88.4% disagreed with the statement that a thick and tight cervix facilitates labour. **Item 63** indicated that 32.7% of the midwives agreed and 64.1% disagreed with the statement that meconium-stained liquor is a sign of amniotitis, and 3.2% did not respond to the statement. **Item 64** indicted that 63.2% agreed and 35.75 disagreed with the statement that in primigravida the head should have engaged at 38-39 weeks of pregnancy. **Item 65** indicated that 77.9% of the midwives agreed and 22.1% disagreed with the statement that posterior position leads to prolonged labour. **Item 67** indicated that 19.0% of the midwives agreed and 81.0% disagreed with the statement that the presence of moulding 3+ is a good indication of descent of the fetal head in labour. **Item 68** indicated that 84.21% of the midwives agreed and 15.8% disagreed with the statement that continuous strong contractions may lead to rupture of the uterus. **Item 71** indicated that 69.5% of the midwives agreed and 30.6% disagreed with the statement that pelvic assessment is done at 34-36 weeks of pregnancy



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in primigravida. **Item 72** indicated that 16.8% of midwives agreed and 81.1% disagreed with the statement that a full urinary bladder facilitates descent of fetal head, and 1.1% did not respond to this statement. **Item 77** indicated that 33.6% of the midwives agreed and 58.9% disagreed with the statement that descent of the fetal head takes place in a deflexed head, and 7.4% did not respond to the statement. **Item 80** indicated that 52.6% of the midwives agreed and 42.1% disagreed with the statement that a Bishop score of 6 is a good indication of induction at 42 weeks of pregnancy, while 5.3% did not respond to the statement.

The findings might conclude that midwives perceived themselves to have knowledge of the following five skills: "A thick and tight cervix facilitates good progress of labour", "Posterior position of the fetus leads to prolonged labour", "Continuous strong contractions may lead to rupture of the uterus", "Presence of moulding 3+ is a good indication of descent of the head during labour", and "A full urinary bladder facilitates descent of the fetal head during labour. However, they lacked knowledge of the following four skills: "Meconium-stained liquor is an indication of amniotitis", "In primigravida the head should have engaged at 38-39 weeks of pregnancy", "Descent of the fetal head takes place in deflexed head", and "A Bishop Score of 6 is a good indication of induction at 42 weeks of pregnancy".

**Items 74, 76 and 78** were clustered, communicated and interpreted together under perception of knowledge regarding the outcomes of high risk conditions during pregnancy and labour.



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**Table 4.17 Outcomes of high risk conditions**

| Knowledge of the midwives | Agee | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | F | % | f | % |
| 74. Diabetes mellitus during pregnancy may cause obese babies leading to difficult delivery | 86 | 90.5 | 8 | 8.4 | 1 | 1.1 | 95 | 100.0 |
| 76. PIH causes decrease in uterine blood flow and placental dysfunction if not treated properly | 70 | 73.7 | 21 | 22.1 | 4 | 4.2 | 95 | 100.0 |
| 78. Antepartum haemorrhage, prolonged labour and premature labour are conditions that compromise the fetus | 68 | 71.6 | 26 | 27.4 | 1 | 1.1 | 95 | 100.0 |

**Item 74** indicated that 90.5% of the midwives agreed and 8.4% disagreed with the statement that diabetes mellitus during pregnancy may cause obese babies leading to difficult delivery, while 1.1% did not respond to the statement. **Item 76** indicated that 73.7% agreed and 22.1% disagreed with the statement that pregnancy-induced hypertension (PIH) causes a decrease in uterine blood flow and placental dysfunction if not treated properly. **Item 78** indicated that 71.6% of the midwives agreed and 27.4% disagreed with the statement that antepartum haemorrhage, prolonged labour and premature labour are the conditions that compromise the fetus, and 1.1% did not respond to this statement. The findings might conclude that midwives have knowledge of all three skills related to the outcomes of high risk conditions during pregnancy and labour.

**Items 70 and 75** were clustered, communicated and interpreted together under the acquisition of knowledge regarding management of first stage of labour.



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**Table 4.18 Management of first stage of labour**

| Knowledge of the midwives | Agee | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | F | % | f | % |
| 70. Fetal heart rate is monitored ¼-hourly during the active phase of labour | 57 | 60.0 | 38 | 40.0 | - | - | 95 | 100.0 |
| 75. Maternal condition is recorded on the partogram | 80 | 84.2 | 13 | 13.7 | 2 | 2.1 | 95 | 100.0 |

**Item 70** indicated that 60% of the midwives agreed and 40% disagreed with the statement that fetal heart rate is monitored ¼-hourly during the active phase of labour. **Item 75** indicated that 84.2% of the midwives agreed and 13.7% disagreed with the statement that maternal condition is recorded on the partogram, while 2.1% did not respond to the statement. The findings might conclude that midwives lacked knowledge on one skill: "Fetal heart rate is monitored ¼-hourly during the active phase of labour", and they had knowledge of one skill: "Maternal condition is recorded on the partogram".

**Items 66, 69 and 79** were clustered, communicated and interpreted together under the acquisition of knowledge regarding management of second stage of labour or delivery of the baby.

**Table 4.19 Delivery of the baby**

| Knowledge of the midwives | Agee | | Disagree | | Mis | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | F | % | f | % |
| 66. Resuscitation of a newborn requires extra skills and experience | 82 | 86.3 | 13 | 13.7 | - | - | 95 | 100.0 |
| 69. In multiparous women duration of second stage of labour should not exceed 30 minutes | 66 | 69.5 | 29 | 30.5 | - | - | 95 | 100.0 |
| 79. Vacuum extraction is the best in case of delayed second stage of labour | 42 | 44.2 | 52 | 54.7 | 1 | 1.1 | 95 | 100.0 |



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**Item 66** indicated that 86.3% of the midwives agreed and 13.7% disagreed with the statement that resuscitation of a newborn requires extra skills and experience. **Item 69** indicated that 69,5% of the midwives agreed and 30.5% disagreed with the statement that in multiparous women duration of the second stage of labour should not exceed 30 minutes. **Item 79** indicated that 44.2% of the midwives agreed and 54.7% disagreed with the statement that vacuum extraction is the best in case of delayed second stage of labour. The findings might conclude that midwives have knowledge of the following two skills: "Resuscitation of a newborn requires extra skills and experience", and "In multiparous women duration of second stage of labour should not exceed 30 minutes". They lack knowledge of one skill: "Vacuum extraction is the best in case of delayed second stage of labour".

According to Guidelines for Maternity Care in South Africa, safe delivery of both mother and baby depend upon the knowledge and skills of the midwife during labour. Knowledge is a prerequisite for proper management of the woman during antenatal care and labour. Fullerton & Ingle (2003:429) also report a similar view. The goal of the teaching and learning process for midwives is to acquire knowledge, demonstrate critical thinking ability and demonstrate competence in performing midwifery skills. Guidelines for Maternity Care further indicate that midwives are best equipped to provide technologically appropriate care to women during their reproductive health lives for the best possible outcome for both mother and baby (Godi *et al.*, 2007:6). The Regulation (R2488) also stipulates application of knowledge when performing midwifery care, for example internal examination to determine the progress of a woman during labour and where contraindicated, cutting for episiotomy and administration of obstetric analgesia, management of post-partum haemorrhage, that is, correlation of theory and practice. Lack of knowledge may imply poor performance of midwifery skills.



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## 4.5 OPINIONS REGARDING MANAGEMENT OF PREGNANT WOMEN BY MIDWIVES (SECTION D)

In this section, midwives were requested to give their own opinions regarding the management of a pregnant woman. They were expected to answer three open-ended questions. Each questionnaire was checked, and responses were listed, classified and analyzed. Out of 95 respondents, the responses of 3% of the midwives were irrelevant to the phrased questions. For example, an answer for the factors contributing to low Apgar scores was responded to by writing "women with extreme behavior; problems encountered from doctors was responded to by writing, "fetal distress". Another 11% responded by giving insufficient responses. They wrote one answer to each question. Seven percent did not respond at all, so the 79% positive responses were analysed.

### Item 81: Contributory factors to low Apgar scores

To **Item 81**, 86% of midwives responded by indicating the following as contributory factors to low Apgar scores.

- Delayed first and second stage of labour.
- High blood pressure
- Obstructed labour
- Premature rupture of membranes of more than 72 hrs
- Insufficient facilities
- Meconium-stained liquor grade 3
- Maternal malnutrition
- Congenital abnormalities
- Poor co-operation of women during labour
- Inability of midwife to detect meconium-stained liquor
- Absence of protocols for management of Pregnancy-Induced Hypertension and Diabetes mellitus



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The reviewed literature cited in chapter 2 of this study indicated that babies born with low Apgar scores of less than 7 at one or five minutes were mostly exposed to delayed first and second stage of labour, high blood pressure, obstructed labour, premature rupture of membranes for more than 72 hrs, meconium-stained liquor grade 3 and congenital abnormalities as contributory factors to low Apgar scores (Velaphi, Mokhachane, Mphahlele, Beck-Arnold, Kuwanda & Cooper, 2005:504). A research study was done in 1998 at Chandigarh Medical Education and Research School in India with 222 neonates who were born with low Apgar scores of less than 7 at one minute and five minutes. The aim of the study was to identify the contributory factors to low Apgar scores among the neonates. The outcome of the study revealed that out of 222 neonates with low Apgar scores, 50% of the cases were caused by very premature rupture of membranes, antepartum hemorrhage and pregnancy-induced hypertension.

The findings of this study might imply that midwives had knowledge concerning the contributory factors of low Apgar scores among the neonates. It might however conclude that having knowledge did not mean being competent in performing midwifery skills. They might lack the ability to correlate theory and practice in practical situations resulting in poor management of pregnant women during labour.

**Item 82: Preventive measures against low Apgar scores**

**In item 82** the midwives indicated that the following measures could be implemented in order to prevent low Apgar scores among the neonates:

- Control blood pressure to prevent increase
- Refer the woman with premature rupture of membranes to the hospital
- Avoid forceps delivery and vacuum extraction
- Do caesarian section in obstructed labour
- Shorten second stage of labour
- Reassure the woman during labour for co-operation
- Manage first and second stage of labour well.



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**Item 83: Problems encountered with the doctors**

**In item 83,** midwives responded by writing that the following problems were encountered with doctors.

- They switched off their cell phones
- Nurses had to explain patient's condition telephonically, instead of their coming to see the patient
- They delayed coming to see the patient
- They did not listen to nurses' suggestions, just said it was final
- They gave more reviewing time
- There was only one doctor for the night, who was responsible for obstetrics and general patients
- They felt threatened by the midwife's knowledge, and this created a negative attitude
- They gave telephonic orders

The outcome of a research study done in Scotland revealed that doctors had better obstetric knowledge and skills than midwives, but they did not always give midwives the recognition they felt they deserved. Midwives criticized the general practitioners concerning their lack of skill in obstetric services, for example, performing an induction when the cervix was in an unfavourable condition, and their poor technique in forceps delivery. Midwives knew good midwifery nursing and they could push the general practitioner through patient's advocacy (Chapman & Hall, 1996:48).

There was nothing like the frustration experienced by midwives when they were faced with obstetric problems and the doctor responsible for rescuing them was not available but just gave a telephonic prescription with recurrent reviews. The poor midwife had to stand firm at the centre, advocate continuously to convince the unprepared doctor. Midwives remained responsible for their own acts and omissions for the labouring women and accountable for everything (Chapman & Hall, 1996:50).



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During March 2007 the researcher had the opportunity to analyse 30 maternity case records of babies who had low Apgar scores from three selected hospitals where the research was conducted. The findings from this study of the analysed maternity case records revealed that 47% and 53% of the midwives were competent and incompetent respectively in the recording of labour progress; 43% and 57% midwives were competent and incompetent respectively in the monitoring and interpretation of the cardiotocograph; 43% and 57% midwives were competent and incompetent respectively in correct plotting of the partogram; 43% and 57% neonates were delivered by caesarian section (13 cases) and normal vertex delivery (17cases) respectively; 40% had delayed first stage (7 cases) and 46% (5 cases) had delayed second stage of labour and of 13 cases of caesarian section, 46% (6) had a 2-hour delay before the operation was performed after being booked by the doctor and had poor interventions in respect of problems reported to the doctor.

According to Guidelines for Maternity Care in South Africa and Regulation R2488, midwives are responsible for recording the progress of pregnancy, labour and pueperium including neonatal care, in the maternity case record book. The practice of midwives is subject to the provisions of this regulation. All findings of maternal condition, fetal condition and progress of labour are recorded in the partogram. Failure of the midwife to use the partogram constitutes substandard care and an incompetent midwife. Proper interpretation of the partogram indicates good progress of labour or extremely poor progress which usually results in babies born with low Apgar scores. Guidelines for Maternity Care and Regulation R2488 emphasise proper recording and record-keeping.



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## 4.6 CONCLUSION

In this chapter data were presented and analysed. The assessment of the competency of midwives focused on the characteristics of the midwives, the knowledge and the skills acquired in performing midwifery (obstetric) skills were the key areas to be addressed. The research results revealed that there were some areas where midwives still lacked the knowledge and skills required in the management process of a pregnant woman prior to conception, pregnancy and labour. Their competency level was still below 65% as set for each item in this study in some areas, hence the need for post-basic training in advanced midwifery and neonatal care for proper management of the pregnant woman. Very few midwives were 40 years and older. In chapter 5, the research findings are discussed, focusing on areas where midwives lack knowledge and skills.



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# CHAPTER 5

# DISCUSSION OF THE FINDINGS

## 5.1 INTRODUCTION

Chapter 2 of this study dealt with a detailed description of a literature review of previous research studies on topics related to the knowledge and competence of midwives related to the prevention of low Apgar scores among neonates. It provided a great deal of the background information needed for fruitful conceptualization. Chapter 4 analysed the data collected during the study. This chapter focuses on the discussion of the results of the study conducted with midwives regarding their competencies to prevent low Apgar scores among neonates. It further examines whether the objectives of the study were achieved. Discussion of the findings was based on the key areas presented in the results. Relevant data from literature review were incorporated. According to Polit and Hungler (1999:27), conceptualisation is the process whereby the findings of the study are supported or refuted by a process of grounding ideas, designs and plans on previous research. In this study the key concepts are the knowledge and competencies of midwives. A great deal of interest was placed on lack of knowledge and skills in performing midwifery skills for pregnant women from conception till delivery/birth of the baby. Applicable literature was reviewed to support the findings in relation to incompetence and lack of knowledge among midwives to prevent low Apgar scores among neonates. Some of the key areas which are related were grouped together and the discussion done simultaneously.

The results of the study revealed that midwives perceived themselves to be incompetent in performing the following skills:

- Taking and recording of blood pressure correctly (55.8%)
- Detecting a larger diameter of the fetal skull in a deflexed head (55.8%)
- Managing the effect of pethidine (44.2%)
- Delivery of breech presentation (56.8%)



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- Performing vacuum extraction (9.5%)
- Performing midwifery forceps delivery (8.4%)
- Delivering of shoulder dystocia during second stage of labour (52.6%)
- Interpreting any deviations from the cardiotocograph (55.8%)
- Carrying out measures in case of caput 2++ (62.1%)

Results also revealed that midwives lacked knowledge regarding the following:

- During palpation the palmar surfaces of the fingers determine the soft consistency of the fetus (64.3%)
- The hands grasp the fetal mass at the centre to assess fetal weight and size (49.4%)
- Recurrent pregnancy leads to poor fetal growth (40.0%)
- In primigravida the head should have engaged at 38-39 weeks of pregnancy (63.2%)
- Meconium-stained liquor is an indication of amniotitis (64.1%)
- Descent of the fetal head takes place in a deflexed head (58.9%)
- A Bishop score of 6 is a good indication of induction at 42 weeks of pregnancy (52.6%)
- Fetal heart rate is monitored ¼-hourly during the active phase of labour (60.0%)

## 5.2 IDENTIFIED INCOMPETENCE AS PERCEIVED BY MIDWIVES

According to Guidelines for Maternity Care in South Africa (Godi *et al.*, 2007:41) and R2488 (SANC, 1990:2), all midwives in South Africa must reach acceptable standards set for the management of a pregnant woman during antenatal care, labour and puerperium, including neonatal care. Midwives must have the necessary knowledge, experience and skills in



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performing midwifery care to ensure the delivery of a live and healthy baby without any injury or harm. Lack of the identified skills may result in poor neonatal outcome.

- **Taking and recording of blood pressure correctly**

According to the National Health Plan for South Africa (African National Congress, 1994:84), priority was given to antenatal care and delivery. Deliveries take place mostly at hospitals, health centres and rural clinics where labour is monitored and deliveries conducted by midwives. Home delivery, either by professional or lay midwives, is not encouraged. The basic objective is to ensure the delivery of a live and healthy baby with an Apgar score of 10/10 at one minute without any injury or harm to either baby or mother (De Haan, 1996:151). According to Godi *et al.* (2002:40), all midwives are expected to be competent in taking and recording blood pressure correctly during antenatal care and during labour and recording it in the partogram. Taking and recording blood pressure is one of the common skills taught and demonstrated during the first year of training of a nurse. This is continued throughout nursing. Midwives are empowered with knowledge and they receive high-quality and timely training in basic skills like this. This is done so that they will be able to deliver the best midwifery care in their practical work to prevent low Apgar scores among neonates (http://www.midwifery council.org/conte 2006, accessed 30 January 2009). Lack of skills in taking and recording blood pressure correctly by midwives would result in unnoticed hypertension leading to pre-eclampsia, which would cause insufficient fetal circulation and poor fetal growth. During labour increased blood pressure would lead to placental insufficiency which causes fetal distress and if not detected early and urgent action carried out, may lead to a low Apgar score (Myles, *et al.*, 2004:228).

According to Maternity Guidelines in South Africa (Godi *et al.*, 2002:71), hypertensive disorders during pregnancy are the leading causes of maternal and perinatal complications. Proper taking and recording of blood pressure helps with early detection, treatment and follow-up, to reduce their complications. Hypertension may cause severe complications which have a serious negative impact on both the mother and the baby. Uncontrolled hypertension leads to eclampsia (this is a situation where the pregnant woman will have a fit), causing poor blood supply to the baby, resulting in fetal hypoxia. The baby will be delivered through caesarian section and is usually



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born with a low Apgar score.

A study was conducted in Southern Tanzania at three selected hospitals where 196 women were monitored and observed during labour by midwives, aimed at assessing the quality of regular monitoring and recording of blood pressure in the partogram, and the outcome of the pregnancy. The outcome of the study showed that 43% of unsatisfactory fetal and maternal outcomes were due to poor monitoring and recording of blood pressure in the partogram by midwives. Fetal outcome was assessed using the one minute Apgar score. An Apgar score of less than 7 was found in 56 babies (28.8%) of whom five died within 12-18 hours of delivery (Bosse, Massawe & Jahn, 2002:244).

Another study was conducted at Cukurova University School of Medicine in Turkey of 442 pregnant women who were in labour, aimed at evaluating the impact of high blood pressure during pregnancy and labour. The outcome indicated that poor monitoring of blood pressure by midwives resulted in pregnancy-induced hypertension in 15 women. Babies were born with low Apgar scores of less than 7 at five minutes (Demir, Kadyỳfcỳ, Őzgűnen, Evrűke, Vardar, Karaca and Seydaoðlu, 2000:179).

Kandasamy, Merialdi, Guidotti, Betrán, Harris-Requejo, Hakimi, Van Look and Kakar (2008) conducted a survey study of 392 babies in Kabul, Afghanistan with the aim of evaluating the outcome in resource-poor settings. The outcome of this study indicated that 37% neonates had intrapartum stillbirth, and 10.2% had low Apgar scores of less than 7 at five minutes. Poor monitoring of maternal condition with lack of accurate recording of blood pressure was identified. Recommendations were made for providing a method of monitoring blood pressure during labour and improvement that would be useful in other resource-poor settings (Kandasamy *et al.*, 2008:15).

The WHO (1994:1402) and Walraven (1994:617) reported similar findings, that poor monitoring and recording of blood pressure by midwives in the partogram resulted in poor neonatal outcome. Babies were born with low Apgar scores of less than 7 at five minutes. Similar findings were revealed by Orji (2008), where it was reported that during labour, blood pressure was monitored



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and recorded by midwives in the partogram under the supervision of the obstetrician. Low Apgar scores of less than 7 at five minutes were identified in 34 babies, which was due to asphyxia neonatarum and fetal distress.

- **Detecting the larger diameter of the fetal skull in a deflexed head**

The findings of this study revealed that midwives lacked skill in detecting the larger diameter of the fetal skull in a deflexed head. This could only be detected during abdominal palpation. It was not surprising that midwives lacked skill in performing this procedure as it requires expert knowledge, extra skills and experience in order to perform it (Sellers, 2001:1339). Despite the fact that midwives perceived themselves to be competent in performing fundal, lateral, pelvic palpation and Pawlik's grip on a pregnant woman as indicated in **Table 4.10** in chapter 4, they were incompetent in performing this skill. Midwives were solely responsible and should strive to maximize their involvement in abdominal palpation in order to diagnose deflexed head during antenatal care. Furthermore, it was concluded that midwives lacked knowledge concerning the factors that contributed to deflexed head. These included factors such as tight abdominal wall muscles in primigravida, anterior placenta praevia and umbilical cord around the fetal neck. Some of these contributory factors usually led to delayed first stage of labour, causing fetal hypoxia with fetal distress and if caesarian section was delayed, the baby was born with a low Apgar score (Chapman & Hall, 1996:46).

A study conducted in a specific community (which was not mentioned in the study) in the Eastern Gauteng metropolitan area was aimed at assessing the competency of 512 midwives working in maternity units to perform pelvic palpation to diagnose deflexed head. The findings implied that 46% were incompetent in performing pelvic palpation (Fichardt & Viljoen, 2000:113). Recommendations were made for the establishment of further training in specific skills.

Borell and Fendstrom (1997:367) reported from the study done that, in deflexed head, flexion of the head did not occur and this usually resulted in deep transverse arrest. Caesarian section could be performed or rotation and flexion of the head with the application of obstetric forceps delivery could be done. That could lead to poor neonatal outcome, a baby born with a low Apgar score



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and intracranial injury and haemorrhage.

In reporting on the competence of midwives, Chiarella, Thoms, Lau and McInnes (2008:49) indicate that on completion of basic training as a midwife, all midwives are expected to be competent in performing abdominal palpation. This skill is taught and demonstrated during their midwifery training year and it continues throughout in the management of pregnancy, labour, delivery and postpartum period. It can be the basis of ongoing midwifery care, reinforcing responsibility and accountability in the provision of quality midwifery care through safe and effective practice for a healthy mother and baby after delivery. Early detection of deflexed head would help midwives to take immediate action and refer for proper management rather than progressing with labour, leading to prolonged labour and a baby born with a low Apgar score.

- **Management of the effect of pethidine**

O'Sullivan (2005); Howell (2000) and Melzack (1999) report similar views, that analgesia in labour is influenced by parity, duration of labour, experience in a previous labour and induction. Pethidine 50mg to a maximum of 150mg dose is most frequently used during labour. This is because of its administrative ease of use by midwives and is usually administered intramuscularly.

Chamberlain, Wraight and Steer (1993:289) also report that analgesia in labour is indicated to relieve pain. The use of pethidine is also influenced by the parity and the duration of labour following its administration. Administration of pethidine after 7cm of cervical dilatation results in delayed second stage of labour. Most babies born of mothers who were given pethidine after 7cm in dilatation have an Apgar score of less than 7 at five minutes. Recommendations focus on the training of the midwives in monitoring women who were given pethidine.

Elbourne and Wiesman (2000:1239) and Keskin *et al.* (2003:15) reported similar findings from their studies, that pethidine must be given in the active phase of labour with cervical dilatation of 3-5cm, 70-90% effacement of cervix and at least 6 hours before birth of the baby. Monitoring of fetal and maternal condition must be done ½-hourly so that any abnormalities can be detected and immediate action taken.



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A study was carried out at St Thomas hospital in London of 112 women in labour who received pethidine injections during labour with the aim of evaluating its effect on both mother and baby. The outcome indicated that 30% of women suffered side effects such as nausea, vomiting and respiratory depression. Pethidine readily crossed the placental barrier and caused respiratory depression, sleepiness, low Apgar scores in 16 babies and delayed establishment of breast feeding. The restriction of its use when the woman was above 6cm cervical dilatation was recommended due to poor management of women during labour by the midwives (O'Sullivan, 2005:12).

Another study was carried out with 523 midwives in the Orange Free State in South Africa to assess their competency levels in monitoring women who were given pethidine during labour. The results of the study indicated that 21.0% perceived themselves to be competent in monitoring the patient on pethidine for its effect on the baby after delivery and 79.0% were incompetent in managing the woman on pethidine during labour. That might lead to babies born with low Apgar scores.

Keskin *et al*. (2003) reported that a research study was done at the Delivery Unit of Zekai Tahir Burak Women's Health Education and Research Hospital in Ankara, Turkey of 59 women with uncomplicated pregnancies in labour with the aim of evaluating the impact of analgesia on neonates and its adverse effects. The outcome indicated that two women were delivered by caesarian section due to fetal distress. Of the remaining 57 women, 19 babies had low Apgar scores of less than 7 at five minutes due poor management during labour. Detection of early deceleration of fetal heart should have been detected if there had been constant monitoring of the fetal and maternal condition by midwives and urgent action would have been carried out, i.e. emergency caesarian section (Keskin *et al*., 2003:256).

Hodnet (2000:398) also reported the adverse effect of pethidine on a baby if given when cervical dilatation was 6cm and above. The outcome indicated that despite the mode of delivery, babies whose mothers had been given pethidine more than 4 hours prior to delivery were exposed to low Apgar scores of less than 7 at five minutes. Some of them had respiratory distress syndrome, severe asphyxia neonatarum and hypoxic ischemic encephalopathy. It was the responsibility of



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the midwives to advocate on behalf of the patient.

Khor, Jeskin, Cooper and Paterson-Brown (2000) and Shennan (2001) reported similar findings from their studies that poor monitoring of women who were under the influence of pethidine in labour resulted in babies born with low Apgar scores. Midwives should be able to monitor, apply and interpret the cardiotocograph for early detection of any fetal distress and immediate action should be taken to prevent low Apgar scores among the neonates. Midwives had to apply comprehensive, scientific knowledge with the affective and technical skills needed to provide effective and safe midwifery practice within the midwifery scope of practice (McKenna, Hasson & Smith, 2003:314).

- **Delivery of breech presentation**

Brown, Karrison & Cibilis (1994:32) and Cooper & Lawler (2001:558) reported similar findings from their studies that midwives should have the necessary knowledge, skills and attitudes which enabled them to detect and identify breech presentation in the later weeks of pregnancy. This could help with the correction of breech presentation by external cephalic version prior to term and labour.

A study was done with 299 women with Singleton normal breech at Tawam Hospital in Turkey. The results showed that 32.1% delivered vaginally and 67.9% had caesarian section. Neonatal outcome showed that nine babies who were delivered vaginally had low Apgar scores of less than 7 at five minutes and they had poor neonatal outcomes. One of the factors that contributed to low Apgar scores was midwives' lack of skills in delivering breech presentation (Kerbs, Langhoff-Roos, Thorngren-Jerneck, 2001:101).

A study conducted in the Netherlands of 2000 women with breech presentation aimed at evaluating neonatal outcome. Deliveries were conducted by midwives under secondary care. The outcome of the study revealed that neonatal trauma was classified as cephalic haematoma, intracranial bleeding, brachial plexus lesion, fracture of the clavicle and humerus and low Apgar score which was not reported in numerical terms. Contributory factor was midwives' poor technique in delivering breech presentation (Rietberg, 2005:289).



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Allen, Rosenbaum, Ghidni, Poggi and Spong (2002:19) reported that a study of 103 breech deliveries in 1999 at Georgetown University Medical centre in Washington aimed at assessing the outcome of breech delivery by midwives and obstetricians. The results showed that 44 babies had Apgar scores of less than 7 at five minutes and sustained brachial plexus. Caesarian section was recommended for primigravida with breech presentation and where the fetal weight estimation was above 4000g to prevent low Apgar scores.

Demir *et al.* (2000:180) reported that the outcome of a study done in 1997 of 442 pregnant women under the age of 19 years revealed that 45% of the babies born to them had low Apgar scores, 32% were still-born and among the low Apgar scores, five died within 24 hours of delivery. The most common causes of low Apgar scores were pregnancy-induced hypertension and breech delivery. Caesarian section was recommended for primigravida with breech presentation and pregnancy-induced hypertension. Lennox, Kwast & Farley (1998:126) reported after another study that most babies delivered in breech presentation were at high risk of low Apgar scores due to poor management of breech delivery by the midwives.

Eller and Van Dorsten (1993:666) and Lennox *et al.* (1998:356) also reported similar findings from their studies that most babies delivered in breech presentation were at high risk of low Apgar scores due to poor technique in breech delivery by midwives. Recommendations were made for caesarian section in breech presentations. Gregory, Henry, Ramincone, Chan & Platt (1998:51) also reported similar findings of a poor neonatal outcome in breech presentation due to the after-coming head.

- **Performing vacuum and midwifery forceps delivery**

According to **Table 4.4** of chapter 4, only 11% of midwives were qualified advanced midwives who may be considered be capable of performing vacuum extraction. Lack of skills in performing vacuum extraction and forceps delivery might imply that babies were at high risk of low Apgar scores after birth. According to Maternity Guidelines in South Africa (Godi *et al.*, 2002:44) and Sellers (2001b:409), if delivery did not take place within 30 minutes of pushing in multiparous women and 45 minutes in primigravida, vacuum extraction should be performed if the fetal head was 0/5 and caesarian section could be performed in case of 2/5 descent of the head. These



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procedures required extra knowledge, judgment, experience and skills. Vacuum extraction and forceps delivery could only be performed by advanced midwives who had acquired the necessary skills and knowledge (Sellers, 2001b:1496).

Leo, Odibo, Ling, Podis, Borgida and Campbell (2005) reported that a study was carried out at the University of Connecticut health centre in Farmington in the United States of America of 52 mothers who delivered by midwifery forceps. The study did not specify whether the procedure was performed by obstetrician or advanced midwives. The outcome of the study indicated that 24 babies had low Apgar scores of less than 7 at five minutes and it was due to poor technique in the application of forceps delivery. Recommendations suggested that rotational forceps delivery may only be done by obstetricians with expertise, technique, knowledge, and experience (Leo *et al.*, 2005:188).

Gardella, Taylor, Benedetti, Hitti and Critchlow (2001) conducted a study at Johns Hopkins University Medical Centre in America of 500 deliveries with the aim of evaluating the impact of instrumental deliveries on neonates. The outcome of the study indicated that 56% of babies who had low Apgar scores of less than 7 at five minutes were due to vacuum extraction, forceps delivery and poor technique in breech delivery by midwives. However, no specific percentage was indicated for neonates who had low Apgar scores for each procedure performed by midwives. Some infants had permanent brachial plexus, seizures and cerebral palsy (Gardella *et al.*, 2001:899).

A study was conducted at Karilinska University in Sweden and the University of Florence in Italy of 1000 primiparous women in 2006. Medical records were analysed with the aim of assessing risk factors which were associated with obstetric anal sphincter rupture. Labour was progressed and monitored by midwives (Prager', Andersson[2], Stephansson[1], Marchionni[2] & Marions[1] (2008:210). The outcome of the study indicated that obstetric anal sphincter rupture was associated with increased birth weight, prolonged second stage of labour which resulted in instrumental deliveries (vacuum extraction and forceps delivery) in both groups. The incidence of vacuum extraction was higher in Swedish women than in Italian women. The statistics indicated 40 vacuum extractions and 14 forceps deliveries. Of these 48 babies had Apgar scores of less



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than 7 at five minutes with brachial plexus in some of them. However, the study did not specify whether instrumental deliveries were performed by obstetrician or advanced midwives. Interestingly, it was indicated that continuous midwifery practice and support had been shown to reduce the length of labour, the rate of operational vaginal deliveries and caesarian section (Prager *et al.*, 2008:213). Recommendations were made for future studies on evaluating the impact of continuous midwifery support in obstetric care in delivery units (Prager' *et al.*, 2008:215).

Basket, Fanning and Young (2008) conducted a study at Dalhousie University in Canada of 1000 women with the aim of determining perinatal outcome following instrumental delivery. Deliveries were performed by both obstetricians and advanced midwives. Results of the study indicated 87.1% vacuum extraction, 10.9% forceps delivery and 2% caesarian section. Neonatal outcome was 4% intracranial haemorrhage, 3% neurodevelopment delay, one subgaleal haemorrhage and 9% low Apgar score of less than 7 at five minutes. It was concluded that obstetricians and midwives were competent in performing instrument delivery, though unfavourable cup application in vacuum extraction is associated with neonatal trauma (Basket *et al.*, 2008:579).

The WHO (2003) report that forceps and vacuum extraction can only be performed when the presentation is vertex and in after-coming head in breech delivery. The cervix should be fully dilated, head +2 or +3 stations or 0/5 palpable above the brim. Complications such as facial nerve injury lacerations, fractures of face and skull including low Apgar score may occur if midwives are not competent in performing instrument deliveries. It is further indicated that forceps delivery is no longer recommended for delay in second stage of labour due to its serious complications. Caesarian section may be performed. Midwives providing midwifery care to women in labour should have knowledge about indications, contra-indications and complications which may arise (WHO, 2003:35).

According to Maternity Guidelines in South Africa, vacuum extraction may be performed by experienced advanced midwives at community health centres and in district hospitals. In some of the developing countries, such as at Aberdeen maternity hospital, midwives were advised to



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rehearse the application of forceps using a doll and pelvis, and their competencies were evaluated before performing it in a real situation (Myles *et al.*, 2004:665).

Ward (1991:302) reports similar views that lack of experience and expertise by advanced midwives in performing instrument delivery result in poor neonatal outcome, babies born with intracranial injuries and low Apgar score. Fareeduddin and Schifrin (2009) reported similar findings from their studies that vacuum extraction could increase the risk of neonatal intracranial haemorrhage. Their recommendations were based on good communication between advanced midwives and obstetricians including advice on the use of precautions with instrumental vaginal deliveries, or it should be avoided at all costs (Fareeduddin & Schifrin, 2009:810).

Hodnet, Gates, Hofmeyer and Sakala (2007) report similar findings in their study that instrumental vaginal deliveries were associated with increased birth weight and prolonged second stage of labour. Clark, Vines and Belfort (2008) reported findings from their research that vacuum extraction was associated with major fetal intracranial haemorrhage and babies were born with low Apgar scores. Recommendations were made for avoiding routine vacuum extraction; caesarian section was recommended.

- **Delivering of shoulder dystocia during second stage of labour**

Shoulder dystocia is the failure of spontaneous delivery of fetal shoulder after delivery of the fetal head which requires additional obstetric maneuvers. It should be treated as an obstetric emergency which usually has a negative effect on the neonate and the mother (Christie, Harriot, Mitchell, Fletcher & Bambury, 2008:24).

The Royal College of Midwives, Obstetricians and Gynaecology reports risk assessment for the prediction of shoulder dystocia by midwives. However, it is further reported that the characteristics of antepartum and intrapartum such as fetal size and diabetes mellitus are associated with shoulder dystocia as the majority of infants with weight of above 4500g may develop shoulder dystocia (http://www.rcog.org.uk/resourses/public/pdf/shoulder_dystocia2005, accessed 09 February 2009).



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Midwives require the necessary knowledge and skills which would help them to anticipate and recognise shoulder dystocia in order to prevent fetal hypoxia, low Apgar score and death. They must have the ability to estimate fetal weight before labour and delivery. Estimated fetal weight of above 3.5kg should be referred or reported to the doctor and dealt with as an emergency (Godi *et al.*, 2002:48; Myles, *et al.*, 2004: 498).

The research studies from various authors indicate that the incidence of shoulder dystocia increases at the rate of five to nine percent among fetuses weighing 4000g to 4500g for mothers without diabetes mellitus. Complications include brachial plexus, fracture of the clavicles, hypoxia with low Apgar score, Erb's palsy, cerebral palsy, Klumpke paralysis and death may occur (Lam, Wong & Lao, 2002: 1126; Nesbitt, Gilbert & Herrchen, 1998:478).

According to the study done at the University of the West Indies in Jamaica, Christie *et al.* (2008), of 8275 deliveries 69 had shoulder dystocia and out of these 11% of the babies had low Apgar scores of less than 3 at one minute, and 55% of the babies had Apgar scores of less than 7 at five minutes, 3% were still births and 28.8% were delivered by caesarian section due to macrosomia (neonates weighing above 4000g) (Christie *et al.*, 2008:25).

The consideration of selective caesarian section for an estimated fetal weight of ≥ 4500g for non-diabetic mothers to prevent low Apgar scores with neonatal trauma was recommended. American Obstetrics and Gynaecology also stated similar recommendations. Contrary to the above study, Langer, Berkus, Huff and Samueloff (1991) reported that in view of their findings from a study of 75 979 women, there was no relationship between maternal weight and shoulder dystocia. The large majority occurred in children of women with no risk factors, and therefore their finding was that shoulder dystocia was largely unpredictable and unpreventable (Langer *et al.*, 1991:456). The competence of midwives during complicated deliveries with shoulder dystocia was not addressed in the literature review, though a significant difference in one and five-minute low Apgar scores were found.



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According to the research carried out, diabetes mellitus leads to delivery of macrosomic babies. A macrosomic baby is a predisposing factor for difficult delivery or shoulder dystocia resulting in a baby born with a low Apgar score. Intracranial damage and cerebral palsy may be the end result (Bogaert, 1998:176). It was, however, pleasing to realize that 90.5% of the midwives had knowledge regarding the management of diabetes mellitus during pregnancy up to delivery, although 8.4% of the midwives lacked the knowledge and were still practising in maternity units. Hopefully statistics of low Apgar scores due to diabetes mellitus with macrosomic babies would be reduced.

Baxley and Gobbo (2004) and Sokol and Blackwell (2003) reported that shoulder dystocia was one of the most anxiety-provoking emergencies encountered by midwives practising in maternity. Midwives should have knowledge regarding the management of shoulder dystocia by avoiding excessive force on the head and neck of the baby, avoiding fundal pressure as these activities might cause injury to the baby and a low Apgar score. Midwives should be able to identify the risk factors such as abnormal pelvic anatomy, gestational diabetes mellitus, suspected macrosomia and the woman's short stature (Breeze & Lees, 2004:2160).

Mehta, Bujold, Blackwell, Sorokin and Sokol *et al* (2003) and Mocanu *et al*. (2000) reported similar findings, that babies who had shoulder dystocia had low Apgar scores if correct maneuvers were not carried out and the babies were not delivered within five minutes after delivery of the head.

- **Interpretation of any deviation from the cardiotocograph**

Midwives should use monitors to extend their supervisory powers, visual, auditory and tactile. Electrical monitors for the fetal heart brings a greater degree of accuracy than the use of a fetal stethoscope. Fetuses that are at high risk due to maternal complications such as pre-eclampsia, are rescued before fetal compromise and that prevents babies born with low Apgar scores (Myles, *et al*., 2004:122). The Australian Nursing and Midwifery Council produced a national competency standard to assist the midwives to deliver safe and competent care during pregnancy, labour, birth and the postnatal period. The midwives should utilise their knowledge and skills in the application of the cardiotocograph to monitor fetal heart. They should use, justify and interpret



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appropriate technology to achieve the best health outcomes for both the mother and the baby (http://www.midwives.org.au/linkclick 2009).

Breen (1999:31) and Le Roux, Pattison, Makin and Tsaku (1998:180) indicate that all midwives should be competent in the use of cardiotocograph. They should interpret all their findings during the progress and monitoring of labour. Failure to use it or using it incorrectly is associated with misinterpretation of signs of fetal distress. This constitutes substandard care resulting in poor neonatal outcome and babies born with low Apgar scores (Pattison, 2001:23).

Orji (2008) conducted a study of 463 women in labour at Obafemi Awolowo University Teaching Hospital complex in Nigeria in 2007 with the aim of assessing the competencies of midwives in monitoring fetal heart during labour, and evaluating neonatal outcome. Labour was monitored by the midwives under the supervision of the obstetricians. Fetal heart was monitored with the use of the cardiotocograph. The outcome of the study indicated lack of skills in monitoring the fetal heart using the cardiotocograph and poor plotting of the partogram. Neonatal outcome indicated that 17 babies had Apgar scores of less than 7 at one minute and 19 babies had Apgar scores of less than 7 at five minutes (Orji, 2008:250).

A study was carried out in the delivery unit of Zekei Tahir Burak Women's Health Education and Research Hospital in 2001, of a sample of 59 women who were in labour, with the aim of evaluating the impact of poor monitoring of the fetal heart with the aid of the cardiotocograph. The cardiotocograph was used by the midwives to monitor the fetal heart. Interpretation of the findings revealed that fetal distress was detected in four women who were later delivered by caesarian section. Their babies were born with low Apgar scores of 7/10 to 8/10 at one minute and five minutes respectively (Keskin *et al.*, 2003:13).

Midwives are expected to interpret results from the cardiotocograph and where there are abnormalities, to take immediate action for the delivery of a healthy baby with an Apgar score of 10/10 at one minute after birth. Fetal monitoring should be done every 30 minutes before, during and after contraction (Homer, Passant, Kildea, Pincombe & Thorogood, Leap & Brodie, 2009:198; Myles, *et al.*, 2004:223). Another study was carried out in the geographical area of the Free State in South Africa of 523 midwives with the aim of assessing their clinical competencies



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in the application and interpretation of the cardiotocograph. The research results revealed that 56% of the midwives were incompetent in setting, analysing and interpreting the cardiotocograph (Fichardt & Viljoen, 2000:112).

Lansca, Carbonne and Pierre (2007:6) and Orji (2002:145) also reported that lack of skills in monitoring and recording the fetal heart by midwives resulted in babies born with low Apgar scores. Deviations such as fetal distress failed to be picked up and led to low Apgar scores. Pettesson, Svensson and Christensson (2000:88) reported similar findings in their study, that application and interpretation of results from the cardiotocograph required knowledge and skills so that any deviation would be identified and urgent actions carried out to prevent poor neonatal outcome and low Apgar scores.

- **Carrying out measures in case of caput 2++**

Midwives are exposed to managing labour, unsupervised, in primary care settings and hospital settings. Midwives must have knowledge and skill in performing vaginal examination to identify caput 2++, including the level of the fetal head in the pelvic brim. A caput of 2++ and a fetal head which is still high can be one of the signs of cephalic pelvic disproportion (CPD) (Breen, 1999:32). The presence of caput 2++ usually accompanies poor dilatation of the cervix, poor or prolonged first stage of labour resulting in fetal distress and a baby born with a low Apgar score. Midwives should carefully assess, observe and evaluate progress of labour. Formation of caput and moulding should be reported to the doctor and immediate action may be carried out. Caesarian section may be done without delay as these situations are extremely dangerous to the health of the baby (Sellers, 2001b:1415).

## 5.3 IDENTIFIED LACK OF KNOWLEDGE AS PERCEIVED BY MIDWIVES

The Australian Nursing and Midwifery Council (2009:9) indicate that midwives acquire theoretical knowledge during their period of training which is applied in practical situations when performing midwifery clinical skills. Some of the competencies in relation to lack of knowledge were combined and discussed together as they were performed simultaneously. A discussion of key areas in relation to lack of knowledge when performing midwifery skills follows.



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- **During palpation the palmar surfaces of the fingers determine the soft consistency of the fetus and the hands grasp the fetal mass in the centre to assess the fetal weight and size.**

Lack of knowledge in performing the above skill predisposes poor location of fetal position, inability to estimate fetal weight and size, and possible undetected big baby (macrosomia). If labour is progressed and the baby allowed to be delivered normally, it will be born with a low Apgar score due to the difficult delivery of a big baby (Chiarella *et al*., 2008:166).

Mocanu *et al* (2000:231) conducted a study at the American College of Obstetrics and Gynaecologists in America of 175 000 deliveries with the aim of evaluating the impact of macrosomic babies and neonatal outcome. The results indicated that 2 345 caesarian sections which were done were due to macrosomic babies (exceeding 4500g) in order to prevent low Apgar scores among the neonates. Recommendations were made concerning a high level of awareness and confidentiality enquiries into still birth and death in infancy. Caesarian section was recommended for all suspected fetal weight exceeding 4500g.

Another research study of pregnant women and doctors was carried out in Scotland with the aim of assessing their perceptions of midwifery care by midwives during antenatal care. The research results indicated that women viewed midwives at a more personal level because they had more knowledge of their needs than the doctor whom they considered to be on a pedestal. Women preferred to tell midwives their problems rather than the doctor during antenatal clinic because they considered them to have more knowledge about childbearing than men (Barbour, 1990: 214). The general practitioners on the other hand explained that midwives should be used as midwives, not just as nurses, because they were more than just a pair of helping hands due to the knowledge they had acquired. Midwives had considerable midwifery knowledge and skills which needed to be put into practice in midwifery units (Askham & Babour, 1987:158).

Hodnett *et al*. (2007:320) and The Royal College of Obstetricians and Gynaecologists (2001:13) report that there is a relationship between the fetal size and shoulder dystocia. All midwives should be able to perform abdominal palpation to estimate fetal weight and identify macrosomia. They should have knowledge of the factors associated with difficult deliveries because the large



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majority of infants with a birth weight of above 4500g are born with low Apgar scores.

Similar findings were reported by Sokol and Blackwell (2003:89) and Langer *et al.* (1991:833), that a big baby is associated with a difficult delivery and a low Apgar score. Robinson (1990:75) also reported similar findings, that midwives had considerable knowledge and experience of providing midwifery care and women felt more comfortable when they were cared for by midwives.

- **Recurrent pregnancy leads to poor fetal growth**

According to Sellers (2001b:425), recurrent pregnancy is a predisposing factor for a big baby leading to difficult delivery and a low Apgar score if allowed to deliver vaginally. Lack of knowledge would disadvantage them and prevent them from anticipating the outcome of recurrent pregnancies, which may result in babies born with low Apgar scores. The findings might conclude that midwives are lacking in knowledge related to the impact of recurrent pregnancies on the unborn baby.

- **In primigravida the head should have engaged at 38-39 weeks of gestation**

According to Sellers (2001a:586), the fetal head should have engaged into the pelvic brim two weeks before commencement of labour. Failure of engagement is a sign of inadequate pelvis or the presence of some abnormality in the lower pole of the uterus. That will lead to prolonged labour causing fetal distress and a baby born with a low Apgar score. Midwives should apply theoretical knowledge during pelvic palpation and assessment to identify engagement of the fetal head in primigravida. The findings of this study concluded that midwives lacked the knowledge related to engagement of the fetal head in primigravida during pregnancy. Failure of the fetal head to engage at 38-39 weeks of pregnancy requires prompt attention and referral to the hospital for hospital delivery to prevent a low Apgar score.



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- **Meconium-stained liquor is an indication of amniotitis**

The findings of this study revealed that midwives lack knowledge of differentiating meconium-stained liquor and amniotitis. Myles & Strassner (2005:727) report that meconium-stained liquor is detected in three grades and it is an indication of fetal distress which causes a low Apgar score. Amniotitis usually occurs if membranes have been ruptured for more than 24 hours. It is a sign of infection. It may have an offensive smell and is very dangerous to the baby. Midwives should report the woman to the doctor for prophylactic treatment including antibiotics to be administered to prevent a low Apgar score. Davis & Henderson-Smart (2001:310) report that a dexamethathone injection is given to infants who were exposed to amniotitis to extubate the lungs after delivery.

A research study was carried out of 387 neonates at Carlos Urziaz Jiménez hospital in Merida, Mexico in 1997 with the aim of evaluating the impact of amniotitis on newborn babies. The outcome of the study indicated that 83 neonates had low Apgar scores of less than 7 at five minutes. Among the 83 neonates with low Apgar scores, 26 were due to amniotitis which was not treated properly before delivery. It was also associated with prolonged rupture of membranes for more than 24 hours or the woman had undergone multiple vaginal examinations during labour (Zapata-Vazquez, Rodríquez-Carvajal, Sierra-Basta, Alonzo-Vázquez & Echeverríluz-Equiluz, 2003:220).

A study was conducted at Francisco maternity hospital in France of 102 neonates who had amniotitis. The outcome of the study revealed that 46% of them had low Apgar scores and six percent died within 24 hours of delivery. It was also indicated that amniotitis was associated with smoking and placental insufficiency with subsequent fetal hypoxia and fetal distress, if not treated properly (Wiswell, 2001:51).

Hofmeyr (2002:187) and Crowley (2000:176) reported in their studies that meconium-stained liquor was rarely encountered before 38 weeks of gestation. The incidence increases with longer gestation and approximately 30% of pregnancies had this condition at 42 weeks of gestation. Ghidini and Spong (2001:931) and Davis and Henderson-Smart (2001:310) share similar views, that amniotitis is an infection of the amniotic fluid and prophylactic treatment should be given



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prior to delivery to prevent a low Apgar score. Lack of knowledge by midwives leads to poor management of women with amniotitis and causes low Apgar scores among the neonates.

Richardson, Tarnow-Mordi and Escobar (1998:489) and Ward and Sinn (2003:381) share similar views that prolonged rupture of membranes is associated with amniotitis. If midwives lack the knowledge concerning it, it may result in babies born with low Apgar scores.
According to Pattison (2001:8), premature rupture of membranes is the predisposing factor of amniotitis. Prolonged rupture of membranes causes damage to both mother and baby. If the midwife does not have knowledge and delays too long before sending for a doctor for the patient, the infant's chances of survival are poor, as it will suffer fetal distress, a low Apgar score if delivered, or die. The perinatal care survey in South Africa in 2001 analysed the causes of perinatal deaths from 78 343 births. The outcome showed that 3 045 neonates died and the most common primary causes were spontaneous premature labour (Pattison, 2001:8).

- **Descent of fetal head takes place in a deflexed head**

The findings of this study revealed that midwives lacked knowledge about the situations or conditions which facilitated descent of the fetal head. Descent of the fetal head takes place in situations where the fetus is in a complete attitude (flexion) while still in the uterus. In deflexed head, there is no flexion of the head. During labour, it will lead to poor progress which may result in deep transverse arrest. Caesarian section may be performed or rotation and flexion of the head with application of a forceps delivery resulting in poor neonatal outcome. The baby may be born with a low Apgar score (Myles *et al.*, 2004:366).

- **A Bishop score of 6 is a good indication of induction at 42 weeks of pregnancy**

The findings of this study revealed that midwives lacked knowledge regarding the favourable features of a Bishop score for induction of labour. According to Bishop (1994:452) and Buchanan, Macer and Yonekura (2005:123), induction of labour is commenced following full assessment of the woman by the doctor. Midwives should have knowledge of the fact that the favourable induction feature is a score of 6-13. Levis (2007:156) reported research findings that a score of 5 or less was unfavourable for induction of labour. A score of 6 and above indicated that



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the cervix was ripe. Induction of labour could therefore be initiated and had a high probability of being successful. Midwives should have knowledge of the Bishop Score so that they would be able to advocate for their patients. According to the SANC (R2598, 1984:4; R2488, 1990:4), a midwife acts as an advocate for the patient. She speaks on behalf of the woman in labour in order to protect her from possible abuse, neglect or harm.

A study was conducted in the University Hospital, Benin City in Nigeria of 90 primigravida with a low Bishop Score of less than 6. The outcome of the study indicated that methods used for induction failed due to unripe cervix. It was repeated with the insertion of an intracervical Foley balloon overnight to ripen the cervix and was followed by amniotomy and oxytocin titration. The induction delivery interval was prolonged with a poor neonatal outcome of 18% (Augustine & Orhue, 2005:121). Ezimokhai and Nwabineli (1998:284) reported similar findings that a Bishop score of less than 6 had poor induction outcome as the cervix was not yet ripe and ready for dilatation.

- **Fetal heart rate is monitored ¼-hourly during the active phase of labour**

The findings of this study revealed that midwives lacked knowledge, including the ability to monitor the fetal heart during labour. During the active phase of labour, the fetal heart rate is monitored ¼-hourly. This may help with the detection of any sign of early or late deceleration and indicate urgent action to be taken to prevent a low Apgar score. Various methods can be used for monitoring the fetal heart during labour. A survey study was carried out in metropolitan and rural hospitals in South Africa of 102 perinatal deaths due to asphyxia neonatarum. Out of these babies, in 80 cases fetal monitoring was done ¼-hourly, 55% with the aid of a cardiotocograph machine, 32% using the fetal scope and 13% using the hand-held Doppler. Early and late decelerations of the fetal heart were detected which resulted in poor neonatal outcome (Bunchman *et al.*, 2002:30).

In **Table 4.6** of chapter 4 item 7, midwives perceived themselves to be competent in plotting the partogram accurately. According to Maternity Guidelines in South Africa (Godi *et al.*, 2007:37), all findings of maternal and fetal condition, intake and output, medications given including progress of labour, are recorded on the partogram by midwives who are monitoring and



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progressing labour. Failure to use a partogram during labour or incorrect recording with misinterpretation of the findings constitutes substandard care. Poor progress with complications such as fetal distress will result in babies born with low Apgar scores. The WHO (1994) also reported similar views that the partogram was an important tool for monitoring labour and identifying women in need of obstetric intervention. The partogram had been introduced to many countries and supported by guidelines and training workshops for midwives. Decisions about the number of vaginal examinations, augmentation of labour and mode of delivery could be taken in relation to labour progress as plotted on the partogram. If plotting of the cervical dilatation reaches action line, a decision must be taken about the cause of the slow progress and immediate action must be taken or the woman must be transferred to a hospital where there are facilities for emergency services (WHO, 1994:1402).

Orji (2008) conducted a study of 463 women with normal labour with the aim of evaluating the progress of labour using the modified WHO partogram. Labour was monitored and plotted on the partogram by midwives. The results indicated that 102 women who had crossed the action line had delayed first stage of labour which further resulted in poor neonatal outcome. Low Apgar scores were reported in 36 babies at one-minute and five-minute intervals, 25 babies had asphyxia neonatarum and there were 5 stillbirths (Orji, 2008:244). Bosse *et al.* (2002) reported similar findings from their studies, that the partogram was analysed to evaluate neonatal outcome. The results yielded low Apgar scores of less than 7 at five minutes.



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## 5.4 CONCLUSION

The data were discussed in this chapter. The key areas related to lack of skills and lack of knowledge in performing midwifery skills by midwives were addressed. Factors including the lack of skills in performing midwifery skills such as abdominal palpation to detect the larger diameter of fetal skull in a deflexed head, assessment of fetal weight and size, taking and recording of blood pressure correctly, breech delivery, performing vacuum extraction and forceps delivery, delivery of shoulder dystocia, management of the effect of pethidine and lack of knowledge related to the effects of recurrent pregnancy, gestational period for engagement of the fetal head in primigravida, meconium-stained liquor as an indication of amniotitis, that descent of fetal head takes place in deflexed head, and that a Bishop score of 6 is a good indication of induction, contribute to low Apgar scores among neonates. The purpose and the objectives of this study were achieved. The competencies of midwives with regard to the prevention of low Apgar scores were assessed and described. In chapter 6, research findings are summarized. The recommendations and conclusions of this study are addressed.



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# SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

## 6.1 INTRODUCTION

This chapter presents a summary of the findings, conclusions and recommendations of the study of the competence of midwives regarding the prevention of low Apgar scores among neonates. Recommendations arising from this study are provided to help midwives with the management of pregnancy and labour in order to prevent low Apgar scores. They may also be used to suggest areas for future research studies.

The purpose of the study was to analyse the competence of midwives regarding the prevention of low Apgar scores among neonates in the Vhembe district of Limpopo Province. Quantitative research was conducted to address the research problem, which was the competence of midwives. The conclusions and recommendations made were drawn from the findings of the study presented and analysed in chapters 4 and 5, and they are discussed in accordance with the demographic profile, objectives of the study and conceptual framework discussed in chapter 2.

## 6.2 SUMMARY OF FINDINGS

### 6.2.1 Demographic profile of the midwives

Ninety-five midwives participated in the study from three selected hospitals in the Vhembe district of Limpopo Province. Respondents were mainly female (90%) and 10% were men **(Table 4.1).** This was due to the fact that nursing is a female-dominant profession and birth attendance has been done mainly by women since the beginning of midwifery. Midwives are the most common birth attendants internationally and provincially. The average child born into this world is born into the hands of a midwife in the nursing profession who is mostly female. The majority of the midwives had less than three years of experience in midwifery care. That may indicate inadequate exposure and experience in the management of pregnancy and labour. The



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remaining midwives had four years' experience or more, working in various subunits of the maternity care unit. Results further concluded that 70.5% were younger than 40 years, 29.5% were older than 41 years and 3.2% were approaching retirement age. Aging on its own may be related to physical problems contributing to being physically unfit for the maternity unit, resulting in a reduced number of older midwives practising in maternity units. However, the elderly midwives had knowledge and experience, and were therefore capable of providing mentorship to newly qualified midwives and prevent low Apgar scores. Only 10% had post-basic qualifications as advanced midwives. According to Guidelines for Maternity Care in South Africa (2007), advanced midwives are needed at clinics, health centres and district hospitals to provide a 24-hour comprehensive midwifery care service. Lack of professional advancement may result in poor monitoring of pregnancy and labour, resulting in babies born with low Apgar scores.

### 6.2.2 Determination of the competence of midwives

An item was considered to be performed at competent level when 65% and more of the midwives perceived themselves to be competent in it. Results obtained with reference to this objective revealed that midwives perceived themselves to be competent in performing the majority of midwifery skills related to the following:

- **Skills related to the monitoring of fetal heart and progress of labour**

| | |
|---|---|
| Plotting the partogram accurately | **(92.6%)** |
| Monitoring strength of uterine contractions | **(95.8%)** |
| Monitoring of the fetal heart using the fetal scope | **(100%)** |
| Monitoring the fetal heart using the electric monitor | **(93.7%)** |

- **Skills related to assessment and performing vaginal examination**

| | |
|---|---|
| Vaginal examination during labour | **(89.5%)** |
| Performing pelvic assessment during labour | **(74.7%)** |



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| | |
|---|---|
| Detecting the condition of the cervix during labour | (92.6%) |
| Detecting the presence of moulding during labour | (89.5%) |
| Detecting the presence of caput during labour | (94.7%) |
| Detecting cord presentation during internal examination | (84.2%) |
| Resuscitating a newborn baby | (88.4%) |

- **Skills related to delivery of the baby**

| | |
|---|---|
| Delivering the woman during second stage of labour | (95.8%) |
| Cutting for an episiotomy | (94.7%) |
| Delivering with tight cord around the neck | (83.2%) |
| Assisting the doctor during vacuum extraction | (65.2%) |
| Assessment and abdominal palpation of a pregnant woman | (88.4%) |

- **Skills related to assessment and abdominal palpation of a pregnant woman**

| | |
|---|---|
| Abdominal palpation to diagnose posterior position | (83.2%) |
| Abdominal palpation to locate fetal position | (98.9%) |
| Estimating the fetal weight during antenatal care through abdominal palpation | (89.5%) |
| Detecting engagement of the fetal head at 38-39 weeks of pregnancy | (93.7%) |
| Performing fundal palpation | (98.9%) |
| Performing lateral palpation | (92.6%) |
| Performing pelvic palpation. | (81.1%) |
| Performing Pawlik's grip | (77.9%) |
| Measuring of fundal height | (98.9%) |
| Performing pelvic assessment at 34-36 weeks of pregnancy | (73.7%) |



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- **Skills related to monitoring and immediate actions during progress of labour**

| | |
|---|---|
| Managing the woman on trial of scar in labour | **(71.6%)** |
| Taking action in case of continuous strong contractions | **(76.8%)** |
| Detecting signs of early and late deceleration | **(78.9%)** |
| Taking immediate action in case of fetal distress | **(97.9%)** |
| Taking action in case of delayed second stage of labour | **(95.8%)** |
| Identifying meconium-stained liquor grade1, 2 or 3 | **(92.6%)** |
| Carrying out measures in case of meconium-stained liquor | **(87.4%)** |
| Interpreting any deviations from the partogram | **(85.3%)** |
| Taking actions in case the woman crossed the action line | **(89.5%)** |

- **Skills related to diagnosing and management of high risk conditions**

| | |
|---|---|
| Diagnosing early signs of pregnancy-induced hypertension | **(90.5%)** |
| Diagnosing gestational diabetes mellitus | **(77.9%)** |
| Management of pregnancy-induced hypertension | **(84.2%)** |
| Management of diabetes mellitus | **(76.8%)** |
| Management of antepartum haemorrhage | **(86.3%)** |
| Management of premature labour | **(87.4%)** |
| Management of grandemultipara | **(93.7%)** |
| Managing premature rupture of membrane | **(92.6%)** |

### 6.2.3 Assessment of the knowledge of midwives

Results obtained with reference to the assessment of knowledge of midwives revealed that midwives had knowledge related to most midwifery skills that would prevent low Apgar scores in neonates, but not necessarily to all skills outlined in the questionnaire.



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- **Knowledge related to abdominal palpation and outcome of pregnancy**

| | |
|---|---|
| Walking the fingertips of both hands is an excellent method of locating fetal position | **(68%)** |
| A rise in blood pressure of 160/100 during the second trimester is considered pathological and needs advice for rest | **(65.2%)** |

- **Knowledge related to interpretation of findings in pregnancy and labour**

| | |
|---|---|
| A thick and tight cervix facilitates good progress of labour | **(88.4%)** |
| Posterior position of the fetus leads to prolonged labour | **(77.9%)** |
| Presence of moulding 3+ is a good indication of descent of the head during labour | **(81.0%)** |
| Continuous strong contractions may lead to rupture of the uterus | **(84.2%)** |
| Presence of moulding 3+ is a good indication of descent of the head during labour | **(69.5%)** |
| Pelvic assessment is done at 34-36 weeks of pregnancy in primigravida | **(69.5%)** |
| A full urinary bladder facilitates descent of the fetal head during labour | **(81.1%)** |

- **Knowledge related to outcomes of high-risk conditions**

| | |
|---|---|
| Diabetes mellitus during pregnancy may cause obese babies leading to difficult delivery | **(90.5%)** |
| Pregnancy-induced hypertension causes decrease in uterine blood flow and placental dysfunction if not treated properly | **(73.7%)** |
| Antepartum haemorrhage, prolonged labour and premature labour are the conditions that compromise the fetus | **(71.6%)** |



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- **Knowledge related to management of the stage of labour and delivery of a baby**

| | |
|---|---|
| Maternal condition is recorded on the partogram | **(84.2%)** |
| Resuscitation of a newborn requires extra skills and experience | **(86.3%)** |
| In multiparous women duration of second stage of labour should not exceed 30 minutes | **(69.5%)** |

### 6.2.4 Opinions of midwives regarding the management of pregnant women

Midwives were asked to complete the questionnaire and answer three open-ended questions. The first was related to factors contributing to low Apgar scores. The second was related to measures to prevent low Apgar scores, and the third was related to problems encountered with doctors. The findings concluded that midwives perceived themselves to have knowledge of the factors that contribute to low Apgar scores and the measures to be taken to prevent low Apgar scores. However, having knowledge could not be regarded as the key to preventing low Apgar scores among neonates. Knowledge acquired needed to be applied properly. Midwives were experiencing problems with doctors such as switching off their cell phones; nurses having to explain a patient's condition telephonically, rather than doctors coming to see the patient; delay in coming to see a patient; not listening to the nurse's suggestions; allowing more reviewing time; only one doctor for the night responsible for obstetrics and general patients; feeling threatened by the midwife's knowledge; creating a negative attitude; and giving telephonic orders. Maternity case records that were analysed also revealed shortcomings related to negligence by doctors that had contributed to six babies delivered by caesarian section that had low Apgar scores of less than 7 at five minutes. Lack of competence by midwives was revealed in the recording and interpretation of the partogram, and inability to apply and interpret results from the cardiotocograph.



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## 6.3 RECOMMENDATIONS RELATED TO MIDWIFERY PRACTICE

Arising from the findings and conclusions, recommendations relevant to the practice of midwifery nursing management and nursing education were discussed.

### 6.3.1 Recommendations related to improving the competence of midwives in the performance of midwifery skills

- There should be continuous mentoring of newly-qualified midwives by midwife lecturers, preceptors in the maternity unit and experienced midwives.
- On-site, face-to-face training should be developed which includes appropriate history taking, screening and proper examination of pregnant women during antenatal visits.
- The set policies, norms and standards that govern the practice of midwifery should be developed and disseminated. For example, correct use of the partogram should become the norm for all midwives practising at clinics, health centres and district hospitals.
- Regular in-service education should be developed to be given to midwives for the provision of midwifery care to meet maternal and neonatal needs during pregnancy and labour, including pueperium and neonatal care. This could be in the format of workshops, attending symposiums or in-service courses at the hospital to maintain and sustain their competency level.
- Guidelines should be developed for the improvement of skills, the management of complicated deliveries, instrumental deliveries, malpresentation and malpositioning. These guidelines should be utilized appropriately in all institutions, but particularly at clinics, health centres and district hospitals where obstetricians are not readily available.
- Continuous professional development programmes should be provided for all midwives working in maternity units providing comprehensive midwifery care to pregnant women.



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### 6.3.2 Recommendations related to improving the knowledge of midwives on aspects of the prevention of low Apgar scores

- Standardised clinical guidelines should be included in the structured learning curriculum for undergraduate nurses.
- Peer review assessment should be developed to evaluate their competence in providing midwifery care to prevent low Apgar scores among neonates.
- Perinatal review should be conducted at regular intervals, monthly, bi-monthly or quarterly, and information from perinatal review meetings should be disseminated.
- Strategies should be established, developed and implemented to ensure that there is interdisciplinary respect and communication among the doctors and midwives when implementing what they have learned for the best possible outcome for both mother and baby. This could also be achieved by presentation of case studies at regular intervals.
- Protocols on the management of conditions contributing to low Apgar scores among neonates should be developed. The protocols should be in line with the Guideline for Maternity Care in South Africa. All midwives and doctors need to be trained in the implementation of these protocols.
- Audit committees responsible for auditing all discharged maternity case records should be formulated. Midwives should meet monthly to discuss problems experienced and update each other on the latest developments in midwifery care.

### 6.3.3 Recommendations related to nursing management and nursing education

- Staffing norms should be established for every maternity unit concerned with the care of pregnant women. Staffing levels should be reviewed on a regular basis following the evaluation of quality comprehensive midwifery care provided to pregnant women. Adequate midwives should be hired and recruitment can be done by offering career exhibitions at nursing schools. A training site for new recruits should also be established.
- Staff support programmes should be established that will provide moral support and attract younger midwives who may apply new scientific knowledge in midwifery care. Midwifery care is faced with challenges for maternal and neonatal health care. This could



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be achieved by having an open maternity and a supportive working environment characterized by open and frequent communication.

- All midwives should be trained in the correct use, application and interpretation of essential equipment such as electric fetal monitors for the provision of maternal and neonatal health care.
- Managers should develop the practice of giving tangible and intangible rewards such as awarding credits to midwives who display excellent performance in midwifery care regarding aspects such as recording and record-keeping. Such rewards could also be in the form of a trophy or certificate.
- Training policy for the development of staff should be established and implemented and communicated to all professional midwives in the institution. Emphasis should be placed on advanced midwifery and neonatal care.
- Workshops and in-service programmes should be evaluated in terms of their relevance to the needs of mother and baby and the effective delivery of midwifery care services.
- Quality care in maternity units should be reviewed on a regular basis. This review should include the level and comprehensiveness of midwifery practice and the services provided by midwives.
- Training institutions for midwifery should be well staffed with qualified tutors with advanced midwifery and Neonatal care as their specialty.

## 6.4 RECOMMENDATIONS FOR FURTHER RESEARCH

This study found several areas that need further investigation which are identified as follows:

- Factors that contribute to low Apgar scores
- Specific needs of advanced midwives in maternity care centres
- The recruitment and retention of suitably qualified midwives in maternity units
- Factors that hamper midwives in their attempts to provide quality midwifery care at maternity units
- Perceptions of midwives regarding their use of the partogram
- The consequences of low Apgar scores for neonates



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## 6.5 CONLUSION

This chapter focused on a summary of the findings of the study. Conclusions and recommendations drawn from the findings presented and analysed in chapters 4 and 5 were discussed. The study included 95 midwives who agreed to participate in the study and a self-administered questionnaire was used to collect data. Data were analysed by using a computer programme for statistical analysis, Statistic Package for Social Sciences (SPSS). The competence of midwives was assessed by addressing the objectives and the purpose of the study, which were achieved.

The findings of the study revealed aspects where midwives were competent in performing midwifery skills and the knowledge they had acquired, as well as the areas where they lacked knowledge and skills. Maternity care forms an integral component of primary health care, and is one of the priority reproductive issues that require urgent attention. For this reason all midwives need to be competent and equipped with knowledge to provide quality midwifery care as they are dealing with two lives, that of the mother and the baby, and to curb maternal and neonatal complications.

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# ANNEXURE A

## LETTER REQUESTING PERMISSION FROM ETHICAL CLEARANCE

## COMMITTEE UNIVERSITY OF VENDA

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Thohoyandou
0950
25 May 2006
082 446 5625

Senex and Ethical Committee
University of Venda for Science and Technology
Private bag x5050
Thohoyandou
0950

Dear Sir/Madam

**Re: PERMISSION FOR PRESENTATION OF RESEARCH PROPOSAL**

I am Mulondo Seani Adrinah, studying for Masters of Arts in Nursing Science in this University of Venda for science and technology. I hereby wish to request a permission to present my research proposal.

The research topic is the competence of midwives with regard to the prevention of low Apgar score among the neonates in the Vhembe district of the Limpopo Province, South Africa.

Yours truly
Mulondo S.A.



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# ANNEXURE B

## LETTER FOR PERMISSION FROM ETHICAL CLEARANCE COMMITTEE TO CONDUCT A STUDY, DEPARTMENT OF ADVANCED NURSING SCIENCE AT UNIVERSITY OF VENDA

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Prof LB Khoza
Department of Advanced Nursing Science
School of Health Sciences
University of Venda
28 August 2006

## Application for Ethical Clearance - Ms SA Mulondo

The Health, Safety and Research Ethics Committee has at its meeting on the 28 August 2006, approved Ms Mulondo's project entitled: *"The competence of midwives with regard to prevention of low apgar score amongst the neonates in the Vhembe District of Limpopo Province"*.

Prof OS Fatoki
Director: Research and Development

UNIVERSITY OF VENDA FOR SCIENCE AND TECHNOLOGY
PRIVATE BAG X5050
THOHOYANDOU 0950


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## LETTER REQUESTING PERMISSION FROM RESEARCH COMMITTEE IN LIMPOPO PROVINCE TO CONDUCT THE STUDY



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P.0. Box 314
Thohoyandou
0950
25 May 2006
082 446 5625

The Research Committee
Limpopo Province
Department of Health and Social Development
Pietersburg

**Re: PERMISSION TO CARRY OUT RESEARCH STUDY**

I am Mulondo Seani Adrinah employed by the Department of Health and Social Development at Tshilidzini hospital as a chief professional nurse. Presently I am a studying for Masters of Arts in Nursing Science Degree with the University of Venda for Science and Technology. One of the requirements to obtain this degree is to undertake a research project.

I hereby wish to request a permission to collect the data among the midwives who are working at maternity unit from three selected hospitals of the Vhembe district, Limpopo Province. Hospitals were named as Hospital A, Hospital B and Hospital C for the purpose of this study.

The research topic is the competence of midwives with regard to the prevention of low Apgar score among the neonates in the Vhembe district of the Limpopo Province, South Africa. The purpose of the study is to assess and describe the competences of midwives with regard to the prevention of low Apgar score. The findings of this study will assist in making recommendations in improving the competence of midwives and development of the guidelines on managing conditions that commonly result into low Apgar score among the neonates. A self-administered questionnaire with closed and open-ended questions will be completed by midwives during their spare time.



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Enclosed is a copy of research proposal and clearance letter from Ethical committee.

Your assistance in this regard is greatly appreciated.

Yours truly

Mulondo S. A.



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ANNEXURE D

**LETTER OF APPROVAL FROM RESEARCH COMMITTEE DEPARTMENT OF HEALTH, LIMPOPO PROVINCE, TO CONDUCT THE STUDY.**



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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH & SOCIAL DEVELOPMENT

Enquiries: Malomane EL

Ref: 4/2/2

28 February, 2007

Ms S.A Mulondo
University of Venda

Dear Ms S.A Mulondo

**"The Competence of midwives with regard to prevention of low apgar score amongst the neonates in the Vhembe District of Limpopo Province"**

- Permission is hereby granted to Ms S.A Mulondo to conduct the study as mentioned above in Vhembe District Limpopo Province
- The Department of Health and Social Development will expect a copy of the completed research for its own resource centre after completion of the study.
- The Researcher/s should be prepared to assist in interpretation and implementation of the recommendations where possible
- The Institution management where the study is being conducted should be made aware of this,
- A copy of the permission letter can be forwarded to Management of the Institutions concerned

HEAD OF DEPARTMENT
HEALTH AND SOCIAL DEVELOPMENT
LIMPOPO PROVINCE
Date:

Private Bag x 9302 Polokwane.
18 College Str. Polokwane 0700. Tel: (015) 293 6000 Fax: (015) 293 6211 Website: http/www.limpopo.gov.za

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# ANNEXURE E

## LETTERS OF APPROVAL FROM CHIEF EXECUTIVE OFFICERS OF THREE DISTRICT HOSPITALS TO CONDUCT THE STUDY.



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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF HEALTH AND SOCIAL DEVELOPMENT**
**TSHILIDZINI HOSPITAL**

Private Bag x 924
SHAYANDIMA
0945

Tel : (015) 964 1061/8
Fax : (015) 964 1492
(015) 964 1072

An accessible, caring quality health and social development service for the people of Vhembe District.

**Ref** : S5/3/4

**Enq** : Mr.M.E.Mufamadi

**Date:** 20.03.2007

**To:** Mulondo SA (CPN)

**From:** The Executive Officer
Tshilidzini Hospital

**Re: Permission to conduct Research (Maternity)**

1. The above matter refers.
2. We acknowledge receipt of your letter dated 05 March 2007, with an attachment of approval from the Department of Health & Social Development concerning the above study.
3. It is our pleasure to inform you that you can conduct the Research in the hospital in line with the approval received from the Provincial office.
4. Wishing you success in your studies.

C.E.O: Tshilidzini Hospital

20/03/2007
Date

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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH AND SOCIAL DEVELOPMENT
MALAMULELE HOSPITAL

Ref: S5/4
Enq: Siwela T.S
Date: 09 March 2009

TO WHOM IT MAY CONCERN

**CONFIRMATION FOR A CONDUCTED RESEARCH: MULONDO S.A**

1. This is to certify that Mrs. Mulondo S.A has conducted a research study at Malamulele Hospital during the month of May 2007 for the period of a week in Labour ward

2. The research topic was on "**Competence of Midwives with regard to prevention to low apgar score amongst the neonates in Vhembe District of Limpopo province.** "

3. Attached herein is the Provincial approval for the research study.

Thank you

.....

**Chief Executive Officer: Malamulele Hospital**
**Department of Health and Social Development**

Malamulele Hospital Private. Bag x9245 Malamulele 0982
Tel: (015) 851 0026/1020/1017/1019 Fax: (015) 851 0620

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Ref: S5/6/2/3
Enq: Mphaphuli T.V
DATE: 16 July 2009

TO WHOM IT MAY CONCERN

RE: MULONDO SEANI: PERMISSION TO CONDUCT A RESEARCH

1. This is to certify that Mrs. Seani Mulondo was granted permission to conduct a research study at Donald Fraser Hospital during the month of March 2007.

2. The research topic was on midwives knowledge and competency wherein midwives under labour ward unit were interviewed.

3. Attached herein is the provincial approval for the research study.

Thank you

SENSMzama ..... 2009/07/16 .....
7 CHIEF EXECUTIVE OFFICER DATE

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# ANNEXURE F

## REPORT OF THE EDITOR, DR LC O'CONNELL



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# DR LARAINE C O'CONNELL
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28 January 2010


## TO WHOM IT MAY CONCERN

I, DR LARAINE C O'CONNELL, hereby declare that I am an editor/translator and a registered member of SATI (South African Translators' Institute), Registration number 1001497.

I further declare that I have edited the following dissertation:

**COMPETENCE OF MIDWIVES REGARDING PREVENTION OF LOW APGAR SCORE AMONG NEONATES**

by **Ms SEANI ADREANAH MULONDO**

**STUDENT NUMBER: 11550448**

**A DISSERTATION SUBMITTED IN FULFILMENT OF THE REQUIREMENTS OF THE MAGISTER CURATIONIS DEGREE IN THE DEPARTMENT OF ADVANCED NURSING SCIENCE AT THE UNIVERSITY OF VENDA**

**SUPERVISOR: PROF. LB KHOZA**

**CO-SUPERVISOR: PR RISENGA**

**DR LC O'CONNELL**
**28 JANUARY 2010**

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## ANNEXURE G

## CONSENT FORM: LETTER REQUESTING MIDWIVES TO PARTICIPATE IN THE STUDY.



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# CONSENT FORM

Dear participant

Thank you for agreeing to participate in this study. I am Mulondo Seani Adrinah, a student studying for Master of Arts in Nursing Science Degree with the University of Venda for Science and Technology (UNIVEN) currently busy with research study. This study seeks to assess and describe the competence of midwives with regard to the prevention of low Apgar score amongst the neonates with the hope to make recommendations for improvements where need be.

Participation in the research is entirely voluntary. You are free to opt out of the study if for any reason you feel uncomfortable to continue as the respondent. If you withdraw from the study, there will be no penalties and you will not be prejudiced in anyway.

Confidentiality and anonymity will be maintained at all times during data collection. Neither your name nor the name of your hospital shall appear anywhere in the study. No unauthorized person (s) will have access to raw data. Only results of group data will be presented as findings of the study.

Please answer all the questions. Your participation by responding to this questionnaire will be greatly appreciated. If you agree to participate in this study indicate this by writing your name in the space provided below and sign.

I.....Have fully understood the purpose of this study and all the processes and procedures involved and I'm willing to participate on voluntary basis.

Signature of participant.....

Thank you for your time and support.

Mulondo S.A. (R/N, B.A (CUR) HONOURS)



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# ANNEXURE H

## QUESTIONAIRE



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# QUESTIONAIRE FOR THE COMPETENCE OF MIDWIVES WITH REGARD TO PREVENTION OF LOW APGAR SCORE AMONG THE NEONATES

## SECTION A: DERMOGRAPHIC DATA

General background information is important as it indicates the characteristics of competent midwife. Please answer question 1- 8 by filling in the blocks provided

Example:

**Indicate your present age [31]**

1. Indicate your sex
    1. Male [ ]
    2. Female [ ]
2. Indicate your present age [ ]
3. Indicate your period of experience as a midwife [ ]
4. Indicate the section in which you are currently working
   (Mark with an "X" for appropriate answer)
    1. Antenatal clinic [ ]
    2. Labour unit [ ]
    3. Post natal unit [ ]
    4. Neonatal unit [ ]
5. Your professional basic and post basic qualifications is/are:
   (Mark with an "X" for appropriate answer)
    1. Registered nurse and midwife [ ]
    2. Degree in Bachelor of Arts in nursing [ ]
    3. Diploma in Advanced midwifery [ ]
    4. Any other specify----------



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**SECTION B**

In this section you will do self-assessment to determine how competent you are on performing midwifery skills. Please respond by marking with an "X" as in Section A in the appropriate block.

1. Competent: C
2. Incompetent: INC

| **I am competent in** | **C** | **INC** |
|---|---|---|
| 6. taking and recording of blood pressure correctly | | |
| 7. plotting the partogram accurately | | |
| 8. monitoring the strength of uterine contractions | | |
| 9. monitoring fetal heart using the fetal scope | | |
| 10. monitoring fetal heart using electric fetal monitor | | |
| 11. performing internal examination during labour | | |
| 12. performing pelvic assessment during labour | | |
| 13. interpreting any deviations from cardiotocograph | | |
| 14. detecting the condition of the cervix during labour | | |
| 15. detecting the presence of moulding during labour | | |
| 16. detecting the presence of caput during labour | | |
| 17. detecting the larger diameters of fetal skull in a deflexed head | | |
| 18. delivering the woman during the second stage of labour | | |
| 19. delivering breech presentation | | |
| 20. performing vacuum extraction | | |
| 21. performing midwifery forceps delivery | | |
| 22. resuscitating a newborn baby | | |
| 23. managing the woman on trial of scar in labour | | |
| 24. palpating pregnant woman to diagnose posterior position | | |
| 25. delivering shoulder dystocia during second stage of labour | | |



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| I am competent in | C | INC |
|---|---|---|
| 26. locating the fetal position through abdominal palpation | | |
| 27. estimating fetal weight through abdominal palpation | | |
| 28. detecting the engagement of fetal head at 38-39weeks in primigravida | | |
| 29. performing fundal palpation to a pregnant woman | | |
| 30. performing lateral palpation to a pregnant woman | | |
| 31. performing pelvic palpation to a pregnant woman | | |
| 32. performing pawlik'sgrip to a pregnant woman | | |
| 33. measuring height of fundus by abdominal palpation | | |
| 34. performing pelvic assessment at 34-36weeks of pregnancy to exclude pelvic inadequacy | | |
| 35. cutting an episiotomy during the second stage of labour | | |
| 36. delivering tight cord around the neck | | |
| 37. detecting cord presentation during internal examination | | |
| 38. taking actions in case of continuous strong contractions | | |
| 39. detecting signs of early and late deceleration | | |
| 40. taking immediate actions in case of fetal distress | | |
| 41. taking actions in case of delayed second stage of labour | | |
| 42. identifying meconium stained liquor grade 1, 2 or 3 | | |
| 43. carrying out measures in case of meconium stained liquor | | |
| 44. carrying out measures in case of caput 2++ | | |
| 45. diagnosing early signs of pregnancy-induced hypertension | | |
| 46. diagnosing gestational diabetes mellitus | | |
| 47. managing pregnancy-induced hypertension | | |
| 48. managing diabetes mellitus during pregnancy | | |
| 49. managing antepartum hemorrhage | | |
| 50. managing premature labour | | |
| 51. managing grandemultipara woman till delivery | | |
| 52. managing premature rupture of membranes | | |



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| I am competent in | C | INC |
|---|---|---|
| 53. managing the effect of pethidine to the baby | | |
| 54. interpreting any deviations from the partogram | | |
| 55. taking actions in case the woman crossed the action line | | |
| 56. managing cord presentation | | |
| 57. assisting the doctor during vacuum extraction | | |

**SECTION C**

This section is intended to assess your knowledge in the management process of a woman during pregnancy and labour. Please respond by marking with an "X" in the appropriate block.

1. Strongly agree: SA
2. Agree: A
3. Disagree: D
4. Strongly disagree: SD

| Knowledge of the midwives | SA | A | D | SD |
|---|---|---|---|---|
| 58. During palpation the palmar surfaces of the fingers determine the soft consistency of the fetus | | | | |
| 59. Walking the fingertips of both hands is an excellent method of locating fetal position | | | | |
| 60. Recurrent pregnancy lead to poor fetal growth | | | | |
| 61. Thick and tight cervix facilitate good progress of labour | | | | |
| 62. The hands grasp the fetal mass in the centre to assess the fetal weight and size | | | | |
| 63. Meconium-stained liquor is an indication of amniotitis | | | | |



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| Knowledge of the midwives | SA | A | D | SD |
|---|---|---|---|---|
| 64. In primigravida the head should have engaged at 38-39 weeks of pregnancy | | | | |
| 65. Posterior position of the fetus lead to prolonged labour | | | | |
| 66. Resuscitation of a newborn require extra skills and experience | | | | |
| 67. Presence of moulding 3+ is a good indication of descend of the head during labour | | | | |
| 68. Continues strong contractions may lead to rupture of the uterus | | | | |
| 69. In multiparous women duration of second stage of labour should not exceed 30minutes | | | | |
| 70. Fetal heart rate is monitored 1/4hourly during the active phase of labour | | | | |
| 71. Pelvic assessment is done at 34-36weeks of pregnancy in primigravida | | | | |
| 72. Full urinary bladder facilitate descend of the fetal head during labour | | | | |
| 73. A rise in blood pressure of 160/100 during the second trimester is considered pathological and needs advice for rest | | | | |
| 74. Diabetes mellitus during pregnancy may cause obese babies leading to difficult delivery | | | | |
| 75. Maternal condition is recorded on the partogram | | | | |
| 76. PIH causes decrease in uterine blood flow and placental dysfunction if not treated properly | | | | |
| 77. Descend of the fetal head takes place in deflexed head | | | | |
| 78. Antepartum haemorrhage, prolonged labour and | | | | |



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| | | | | |
|---|---|---|---|---|
| premature labour are conditions that compromise the fetus | | | | |
| 79. Vacuum extraction is the best in case of delayed second stage of labour | | | | |
| 80. Bishop score of "6" is a good indication of induction at 42weeks of pregnancy | | | | |

**SECTION D**

In this section you will be allowed to give your own opinion regarding management of pregnant woman.

81. What do you think are the contributory factors to low Apgar score among the neonates?

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How can low Apgar score be prevented?

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83. What problems do you encounter from the doctors when reporting women with problems in labour?

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**THANK YOU FOR YOUR PARTICIPATION**



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