

COMPETENCE OF MIDWIVES WITH REGARD TO THE PREVENTION OF LOW APGAR SCORES AMONG NEONATES

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ABSTRACT

Midwifery practice requires a midwife who is competent in providing antenatal services during pregnancy, labour and puerperium. The midwife should be able to conduct 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 seven or less at five minutes, thus raising the number of babies born with low Apgar scores.

The purpose of the study was to establish the extent of the competence of midwives regarding the prevention of low Apgar scores among neonates. The study attempted to answer the question "To what extent are midwives competent to the prevention of low Apgar scores?"

The study was designed as a quantitative and descriptive research. A sample of 100 midwives working in the maternity units of three district hospitals was selected. A non-probability purposive sampling method was used to select participants. A self-administered questionnaire with closed questions was used to collect data.

The findings revealed that midwives perceived themselves to be competent in performing most midwifery skills, but incompetent in performing some critical skills related to midwifery care, such as taking and recording blood pressure correctly.

Standardised clinical guidelines for the improvement of skills and the management of complicated deliveries should be utilised appropriately in health settings, especially clinics, health centres and district hospitals.

Keywords: *Midwives; Competence; Apgar score; Neonates; critical skills; obstetrics*

1 INTRODUCTION AND BACKGROUND

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 SANC 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 with 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, 1987:178). The health care system demands a competent nurse practitioner to render quality health care (Morolong & Chabeli, 2005:38).

It is the responsibility of the midwife to ensure that a woman gives birth to a healthy newborn baby with an Apgar score of $\geq 7/10$ at one minute and five minutes 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 may be repeated at five minutes (Myles, Fraser & Cooper, 2004:318).

Most women who seek midwifery care are healthy and require only a health promotion model of care by midwives. Midwives are expected to provide antenatal services, perform abdominal palpation, carry out physical examinations and give health education to expectant women about a healthy life-style which includes diet, care of breasts, preparation for labour and childbearing (Hodnett, Gates, Hofmeyr, & Sakala, 2011:42). It is assumed that good management of pregnant women during antenatal clinic visits and labour leads to neonates born with Apgar scores of 10/10 at one minute. Competent midwives need to understand where gaps exist in support of traditional practices that have yet to be fully examined in a scientific manner with the aim of delivering healthy babies (Fullerton & Thompson, 2005:10).

Millennium Development Goals were established and implemented with the aim of improving the survival of children below the age of five years. South African statistics revealed that four million babies die in the first four weeks of life (neonatal death) (Down, 2011: 2). Apgar scores at birth can be used to identify infants at risks at birth and low Apgar scores is also related to early neonatal mortality. Out of 60-80% of neonatal deaths, 28% were due to prematurity and growth-restricted infants related to low Apgar scores. Prematurity was identified as the primary cause of neonatal deaths due to low Apgar scores of less than seven at one minute.

Midwives are expected to be competent in resuscitation because premature babies and growth-restricted infants are at risk of dying. Many of these components of essential newborn care are currently being addressed with the teaching of resuscitation of newborns in most pre- and post-graduate medical school curricula. An outreach programme to teach resuscitation skills to all midwives involved in newborn care is in process (Blandina, Rolv, Gibson, Raimos, Gunnar & Daltveit, 2011:68; Pieper, 2005:492).

According to the survey carried out of the nine provinces of South Africa in the period 1999-2003 there were 462 348 deliveries and 12 773 deaths; 4 502 occurred during the neonatal period and 32% were related to low Apgar scores. Low Apgar scores were the primary factors in neonatal deaths (MacDonald & Van

Der Walt, 2003:139). Velaphi, Mokhachane, Mphahlele, Beck-Arnold, Kuwanda and Cooper (2005:504) reported similar findings from a study involving 2164 very low birth-weight infants. The study revealed that 1 566 infants survived, 598 (55%) died in the neonatal unit and 85 died in the labour ward before admission to the neonatal unit. The major cause of neonatal death was related to prematurity (75%) and low Apgar scores (25%) (Velaphiet *al.* 2005:507).

Morolong and Chabeli (2005:48) indicate that newly-qualified midwives are not competent in carrying out obstetric skills. Newly-qualified midwives lack knowledge, skills and values which may result in poor neonatal outcome. A crucial factor in the prevention of low Apgar scores is that midwives are expected to be competent in monitoring the foetal heart. Early detection of foetal distress may need immediate attention by obstetricians for the best possible neonatal outcome (Basson, Odendaal & Grove, 2005:38).

Low Apgar score 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 development. The morale of the mothers of babies with low Apgar scores may be affected and lowered because of their unplanned prolonged hospitalisation. 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 provide permanent disability grants for mentally handicapped children.

2 PROBLEM STATEMENT

Midwifery practice requires a midwife practitioner who is competent to practise independently in providing antenatal services during pregnancy, progress labour and conducts delivery on her own for a normal healthy baby. Vhembe region statistics from three particular hospitals, revealed that out of 1 218 deliveries in a particular month in 2010, 43 neonates were born with low Apgar scores and 11 neonatal

deaths were related to birth trauma. The problem of low Apgar scores needs to be researched in order to find solutions to curb mortality rates related to it. This research study sought to determine and describe the competence of midwives with regard to the prevention of low Apgar scores among neonates in the Vhembe District of Limpopo Province.

3 SIGNIFICANCE OF THE STUDY

The findings of the study may be translated to the development of programmes for use during mentoring of newly qualified midwives when they are allocated to maternity unit. 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 lives and neonate's lives with cost quality effective midwifery care based on sound ongoing education to newly qualified midwives may reduce maternal and neonatal mortality rates in the country.

3 DEFINITIONS OF CONCEPTS

3.1 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.

3.2 Low Apgar score

Low Apgar score is evaluation of physical condition in terms of scoring system of 4-6 or less at 5 minutes (Wolf, 1997:1). In this study it shall mean an Apgar score of less than 7/10 at 5 minutes and needs immediate attention.

2.3 Neonate

Neonate is an infant from birth through the first 28 days of life (May & Mahlmester, 1990: 1211). In this study neonate shall mean a

newborn baby who has just delivered until the period of 7 days.

3.4 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 shall mean a midwife registered with the South African Nursing Council responsible for maternal and child care services from conception, during pregnancy, labour and post partum period and conduct deliveries on her own as part of her responsibility.

3.5 Competence

Competence is the ability of the midwives to function completely and proficiently on their own through knowledge and skills acquired throughout their training (Myles et al, 2004:4). In this study competence shall mean ability to practice with confidence, with regard to prevention of low Apgar score amongst the neonates.

4 RESEARCH DESIGN AND METHODOLOGY

3.1 Design

A quantitative descriptive approach was used to determine and describe the competence of midwives to prevent low Apgar scores among neonates. Structured procedures and formal instruments were used to collect numerical information. Numerical data were collected to determine the competence of midwives with regard to the prevention of low Apgar scores among neonates in the Vhembe district of Limpopo Province from three selected hospitals.

3.2 Study setting

The research study was conducted in a clinical setting at Government hospitals in the Vhembe district of Limpopo Province. The district has seven district hospitals and one regional hospital that serve 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 hospitals were chosen as sites for the study to be conducted

3.3 Population, sampling and sample

The target population of this study was 130 midwives working in the maternity units of three selected district hospitals. Midwives were selected because they are knowledgeable about the phenomenon under study. Dempsey and Dempsey (1992:79) indicate that subjects who would provide relevant data in relation to the study need to be selected. A non-probability purposive sampling approach was used to select the hospital sample and midwives. All midwives who were on duty during the period of data collection were sampled by the researchers. Allocation list of midwives practising from three selected hospitals form a sample, 45 midwives from hospital A, 30 from hospital B and 25 from hospital C to form a representative sample of 100 midwives working in maternity units.

3.4 Data collection

A questionnaire was selected as the most appropriate instrument for collecting data. The researchers formulated and designed a questionnaire with closed questions bearing in mind the objectives of the study. Questions were developed based on those competences identified during the literature review regarding the prevention of low Apgar score. On the personal understanding and knowledge of the researchers in midwifery practice contributed to the refinement of the questionnaire. The questions required a response competent or incompetent answer. Self-administered questionnaires were distributed and completed by midwives in maternity units of the hospitals at the time of the visits. Questionnaires were completed during the presence of the researchers and later collected by the researchers.

3.5 Piloting the instrument

A purposive sample of ten midwives was drawn from three different hospitals. The midwives were informed about the purpose and outcome of the study. 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).

3.6 Data analysis

A Statistic Package of Social Sciences (SPSS) computer programme using frequency distributions was used to capture the data. The data were coded and analysed to yield frequencies and percentages and presented in the form of tables.

4 Ethical considerations

Ethical compliance was ensured by securing permission from the Research Committee, Department of Health, Limpopo Province; Director, District Health Services and three district hospitals where the study was conducted. Informed consent provided full information about the study and was understood by participants. The manner in which data would be collected and used was explained to ensure that confidentiality, anonymity and privacy were maintained. Written consent was thereafter obtained from midwives working in maternity units from three selected hospitals. This was done to ensure that there was no relationship of mistrust among the participants (Earle, 1993:631).

5 RESULTS

5.1 Demographic data

Findings are reported together with the discussion. Demographic issues which were addressed in the questionnaire included the age, gender and experience of the midwife. Information about these aspects might be very useful for interpreting the competence of the

midwives regarding the prevention of low Apgar scores among neonates.

The results reveal that 90.5% of the midwives who participated in the study were females and 9.5% were male midwives (accoucher).

The findings indicate that most of the midwives (70.5%) were younger than 40 years of age and 3.2% were approaching retirement age during the period of the study. The implications of the findings indicate that younger midwives are expected to bring new scientific knowledge into midwifery practice; however knowledge, skills, experience of elderly midwives could not be ignored to provide mentorship to newly-qualified midwives.

The findings indicate that 49.5% of midwives had one to three years' experience and 47.3% had * asterisks indicate skills perceived to be incompetently performed)

four or more years' experience in maternity units. However a number of years in a specific field of practice cannot guarantee competence.

5.2 The competence of midwives with regard to the prevention of low Apgar score

The aim of this part of the study was to give respondents an opportunity to report their own perceived competence in performing midwifery skills. For the purpose of this study, an item was considered to be performed at a competent level when it was perceived by 65% and more of the respondents.

The outcomes of findings are indicated in **Table 1**. Competent is denoted by "C", incompetent by "Inc", and missing by "Mis". Items 1-4 were discussed above under the demographic profile.

I am competent in	C		Inc		Mis		Total	
	f	%	F	%	f	%	f	%
5. Taking and recording of blood pressure correctly*	53	55.8	39	41.1	3	3.0	95	100.0
6. Plotting the partogram accurately	88	92.6	7	7.4	-	-	95	100.0
7. Monitoring the strength of uterine contractions	91	95.8	4	4.2	-	-	95	100.0
8. Monitoring foetal heart using the foetal scope	95	100.0	-	-	-	-	95	100.0
9. Monitoring of foetal heart using electric foetal monitor	89	93.7	6	6.3	-	-	95	100.0
10. Performing vaginal examination during labour	85	89.5	9	9.5	1	1.1	95	100.0
11. Performing pelvic assessment during labour	71	74.7	23	24.2	1	1.1	95	100.0
12. Interpreting any deviations from cardiotocograph*	53	55.8	40	42.1	2	2.1	95	100.0
13. Detecting the condition of the cervix during labour	88	92.6	6	6.3	1	1.1	95	100.0
14. Detecting the presence of moulding during labour	85	89.5	9	9.5	1	1.1	95	100.0
15. Detecting the presence of caput during labour	90	94.7	5	5.3	-	-	95	100.0

16. Delivering the woman during the second stage of labour	91	95.8	3	3.2	1	1.1	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
18. Delivering breech presentation *	54	56.8	41	43.2	-	-	95	100.0
19. Performing vacuum extraction *	9	9.5	86	90.5	-	-	95	100.0
20. Resuscitating a newborn baby	84	88.4	11	11.6	-	-	95	100.0
21. Performing midwifery forceps delivery*	8	8.4	86	90.5	1	1.1	95	100.0
22. Managing the woman on trial of scar in labour	68	71.6	23	24.2	4	4.2	95	100.0
23. Palpating pregnant woman to diagnose posterior position	79	83.2	16	17.8	-	-	95	100.0
24. Delivering shoulder dystocia during second stage of labour*	50	52.6	43	45.3	2	2.1	95	100.0
25. Locating the foetal position through abdominal palpation	94	98.9	1	1.1	-	-	95	100.0
26. Estimating foetal weight through abdominal palpation	85	89.5	10	10.5	-	-	95	100.0
27. Detecting engagement of head at 38-39 weeks in primigravida	89	93.7	6	6.3	-	-	95	100.0
28. Performing fundal palpation on a pregnant woman	94	98.9	1	1.1	-	-	95	100.0
29. Performing lateral palpation on a pregnant woman	88	92.6	7	7.4	-	-	95	100.0
30. Performing pelvic palpation on a pregnant woman	77	81.1	18	18.9	-	-	95	100.0
31. Performing Pawlik's grip on a pregnant woman	74	77.9	21	22.1	-	-	95	100.0
32. Measuring height of fundus by abdominal palpation	94	98.9	1	1.1	-	-	95	100.0
33. Delivering tight cord around the neck	79	83.2	16	16.8	-	-	95	100.0
I am competent in	C		Inc		Mis		Total	
	f	%	F	%		f	%	F
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

35. Performing an episiotomy during the second stage of labour	90	94.7	4	4.2	1	1.1	95	100.0
36. Detecting cord presentation during internal examination	80	84.2	15	15.8	-	-	95	100.0
37. Taking action in case of continuous strong contractions	73	76.8	19	20.0	3	3.2	95	100.0
38. Detecting signs of early and late deceleration	75	78.9	19	20.0	-	-	95	100.0
39. Taking immediate action in case of foetal distress	93	97.9	2	2.1	-	-	95	100.0
40. Taking action in case of delayed second stage of labour	91	95.8	4	4.2	-	-	95	100.0
41. Identifying meconium- stained liquor grade 1, 2 or 3	88	92.6	7	7.4	-	-	95	100.0
42. Carrying out measures in case of meconium-stained liquor	83	87.4	12	12.6	-	-	95	100.0
43. Carrying out measures in case of caput 2++*	59	62.1	34	35.8	2	2.1	95	100.0
44. Diagnosing early signs of pregnancy-induced hypertension	86	90.5	9	9.5	-	-	95	100.0
45. Diagnosing gestational diabetes mellitus	74	77.9	20	21.1	1	1.1	95	100.0
46. Managing pregnancy-induced hypertension	80	84.2	15	15.8	-	-	95	100.0
47. Managing diabetes mellitus during pregnancy	73	76.8	22	23.2	-	-	95	100.0
48. Managing antepartum haemorrhage	82	86.3	13	13.7	-	-	95	100.0
49. Managing premature labour	83	87.4	12	12.6	-	-	95	100.0
50. Managing grandmultipara woman to delivery	89	93.7	6	6.3	-	-	95	100.0
51. Managing premature rupture of membranes	88	92.6	6	6.3	1	1.1	95	100.0
52. Managing the effect of pethidine on the baby*	42	44.2	53	55.8	-	-	95	100.0
53. Interpreting any deviations from the partogram	81	85.3	14	14.7	-	-	95	100.0
I am competent in	C		Inc		Mis		Total	
	f	%	F	%		f	%	F

54. Taking action in case the woman crosses the action line	85	89.5	10	10.5	-	-	95	100.0
55. Managing cord presentation	84	88.4	11	11.6	-	-	95	100.0

Table 1: Competence of midwives in performing midwifery skills

This section reveals 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 women receive skilled medical and emotional support by competent midwives. The Guidelines of Maternity Care in South Africa were 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. The SANC stipulates the rules and regulations (R2488) which indicate the conditions under which midwives may practise their profession of midwifery care on pregnant women. This article, however, will focus on the discussion of the critical skills in which midwives perceived themselves to be incompetent, that contribute significantly to a child born with a low Apgar score.

6 DISCUSSIONS

6.1 Taking and recording of blood pressure Correctly

The findings of this study conclude that 56% of the midwives perceived themselves to be incompetent in taking and recording blood pressure correctly. This is a cause of concern in this study as it might further contribute to low Apgar scores among neonates. Taking and recording blood pressure correctly is a **basic and critical skill** which all midwives are expected to be competent in performing, thus a competency level of 100% is expected from midwives. It is also one of the common skills taught and demonstrated during the first year of the training of a nurse. This is continued throughout nursing practice. Midwives receive high-quality training in basic skills (Ulrich, 2009: 1). According to the National Health Plan for South Africa (African

National Congress, 2010:25); priority is given to antenatal care and delivery. The basic objective is to ensure the delivery of a live and healthy baby with an Apgar score of 10/10 at one minute.

Lack of skills in taking and recording blood pressure correctly results in unnoticed high blood pressure leading to placental insufficiency, causing foetal distress and low Apgar scores for neonates (Myles *et al.* 2004:228). This is similar to what was found in the study of assessing the quality of regular monitoring and recording of blood pressure in the partogram involving 196 women in Southern Tanzania. The study showed that 43% of unsatisfactory foetal and maternal outcomes were due to poor monitoring and recording of blood pressure in the partogram by midwives. Apgar scores of less than seven were found in 56 babies (28.8%), five of whom died within 12-18 hours of delivery (Bosse, Massawe & Jahn, 2002:244).

6.2 Detecting the larger diameter of the foetal skull in a deflexed head

The findings of this study reveal that 56% of the midwives perceived themselves to be lacking skills in detecting the larger diameter of the foetal skull in a deflexed head. These findings might further indicate a lack of capability in performing internal examinations to diagnose a deflexed head during labour. This skill is taught and demonstrated during their midwifery training year and it continues throughout in the management of labour. However, it requires expert knowledge, extra skills and experience in order to perform (Sellers, 2001a:1339). It might further indicate that midwives lack knowledge concerning factors contributing to deflexed head such as tight abdominal wall muscles in primigravida, anterior placenta praevia and umbilical cord around the foetal neck which might lead to delayed first stage of labour, causing foetal hypoxia with foetal distress. If caesarean section is delayed, the baby is born with a low Apgar score (Champan, & Hall, 1996:46).

Chiarella, Thoms, Lau and McInnes (2008:49) indicate that on completion of their basic training all midwives are expected to be competent in performing internal examinations to detect deflexed heads. Fichardt and Viljoen (2000:113) report that 46% of the midwives were incompetent in performing internal examinations to diagnose deflexed heads from a study involving 512 midwives in the Eastern Gauteng metropolitan area.

6.3 Management of the effect of Demerol

The findings reveal that 56% of the midwives perceived themselves to be incompetent in the management of the effect of Demerol during labour. This might further indicate that midwives are lacking skills for evaluating carefully the progress of labour through the monitoring of maternal and foetal condition of a woman given Demerol. Poor monitoring might result in failure to detect early deceleration of foetal heart which might expose the baby to a low Apgar score of less than seven at five minutes. Some might have respiratory distress syndrome, severe asphyxia neonatorum and hypoxic ischemic encephalopathy requiring neonatal resuscitation (Hodnett, 2000:398). The primary outcome is delivery within 24 hours without complications (Moodley, Venkatachalam & Songca, 2003:371). Nevertheless, midwives are authorized to acquire, keep and administer Demerol under certain conditions (Howell, 2000; Melzack, 1999). However, its effect is influenced by parity, duration of labour, experience in a previous labour and induction. Demerol dose of 50mg to a maximum of 150mg is most frequently used during labour because of its administrative ease of use by midwives (Elbourne & Wiesman, 2000:1239; Keskin, Keskin, Avsar, Tabuk & Caglar 2003:15).

O'Sullivan (2005:12) reports from a study involving 112 women who received pethidine during labour at St Thomas hospital in London that 30% of the women suffered side effects such as nausea, vomiting and respiratory depression; 16 babies had low Apgar scores of less than seven at five minutes. Furthermore, McKenna, Hasson and Smith (2003:314) report findings similar to another study involving 523 midwives in the Free State in South Africa that 79% of the midwives are incompetent in managing the woman on Demerol during labour.

6.4 Delivery of breech presentation

The findings reveal that 57% of the midwives perceived themselves to be incompetent in delivering breech presentations. Poor delivery technique in breech delivery is a concern as it might lead to poor neonatal outcomes due to the after-coming head. Breech delivery might be treated as an emergency at clinics and health centres where doctors are not readily available. It might also be considered as one of the critical skills which midwives are expected to have acquired technique in breech delivery. Brown, Karrison and Cibilis (1994:32), and Cooper and Lawler (2001:558) report similar findings from their studies that midwives must have the necessary knowledge, skills and attitudes which enable them to detect breech presentation in the later weeks of pregnancy. This could assist with the correction of breech presentations by external cephalic version prior to term and labour. Kerbs, Langhoff-Roos and Thorngren-Jerneck (2001:101) report the outcome of breech delivery from a study conducted at Tawam Hospital in Turkey involving 299 breech deliveries. The results show that 32.1% delivered vaginally and 67.9% had caesarean sections. Neonatal outcomes show that nine babies who were delivered vaginally had low Apgar scores of less than seven at five minutes with poor neonatal outcomes. One of the factors that contributed to low Apgar scores was a lack of delivery technique in breech presentation by midwives.

Similarly, Allen, Rosenbaum, Ghidni, Poggi and Spong (2002:19) as well as Rietberg (2005:289) report that poor delivery techniques in breech presentations by midwives had resulted into cephalo haematoma, intracranial bleeding, fracture of the clavicle and humerus, and low Apgar scores in neonates. However, this was not reported in numerical terms.

6.5 Performing vacuum and midwifery forceps Delivery

According to the study, only 10% of the midwives were qualified advanced midwives who may be considered to be capable of performing vacuum extraction and 90% were incompetent. These findings might indicate that the expected competence of midwives working in maternity units is not satisfactory. Thus lack of skills in performing vacuum extraction and forceps

delivery by midwives leads to babies at high risk of low Apgar scores after birth. According to Maternity Guidelines in South Africa (Department of Health, 2007: 44) and Sellers (2001a:409), if delivery does not take place within 30 minutes of pushing in multiparous women and 45 minutes in primigravida, vacuum extraction or caesarean section should be performed if the foetal head is 0/5 and 2/5 respectively.

Leo, Odibo, Ling, Podis, Bordijdaandand Campbell (2005:186) report from a study involving 52 mothers who delivered by midwifery forceps at the University of Connecticut Health Centre in Farmington in the United States of America those 24 babies had low Apgar scores of less than seven at five minutes due to poor technique in the application of forceps delivery. Similar to this study, Gardella, Taylor, Benedetti, Hitti and Critchlow (2001:899) report from another study involving 500 deliveries that 56% of babies who had low Apgar scores of less than seven at five minutes were due to lack of skills by midwives in performing vacuum extraction.

6.6 Management of shoulder dystocia during second stage of labour

The findings reveal that 53% midwives perceived themselves to be incompetent in management of shoulder dystocia during the second stage of labour. This is a serious cause of concern because shoulder dystocia must be treated as an obstetric emergency which requires additional obstetric manoeuvres for the best possible outcome for the baby. However, shoulder dystocia is one of the most anxiety-provoking emergencies encountered by midwives practising in maternity units, since it is unpredictable and unpreventable (Langer, Berkus, Huff & Samueloff, 1991:456).

Shoulder dystocia is the failure of spontaneous delivery of the foetal shoulder after delivery of the foetal head which requires obstetric manoeuvres (Sellers, 2001b). The majority of infants with weights of above 4500g and diabetes mellitus may develop shoulder dystocia (Christie, Harriot, Mitchell, Fletcher, & Bambury 2008:26). Midwives require the necessary skills and ability to estimate foetal weight of above 4000g before labour. It will assist them to anticipate shoulder dystocia, prevent foetal hypoxia, low Apgar score

and death (Department of Health, 2002:48; Myles *et al.* 2004: 498). The research studies from various authors indicate that fetuses weighing 4000g to 4500g in mothers without diabetes mellitus are at high risk of shoulder dystocia. Complications include brachial plexus injury, fracture of the clavicles, hypoxia with low Apgar score, cerebral palsy, Klumpke paralysis and death (Lam, Wong & Lao, 2002: 1126; Nesbitt, Gilbert & Herrchen, 1998:478).

6.7 Interpretation of any deviation from the Cardiotocograph

The findings reveal that 56% of the midwives perceived themselves to be incompetent in interpreting any deviation from the cardiotocograph. Only 44% of the midwives perceived themselves to be competent in this skill. These might further imply that midwives are lacking skills for application of the cardiotocograph to monitor foetal hearts. Electrical monitors for the foetal heart brings a greater degree of accuracy than the use of a foetal stethoscope. Foetuses that are at high risk due to maternal complications such as pre-eclampsia can be rescued before foetal compromise and prevent low Apgar scores (Myles *et al.* 2004:122).

Orji (2008:280) reports the outcome of a study conducted involving 463 women in labour with the aim of assessing the competencies of midwives in monitoring the foetal heart with the aid of cardiotocograph during labour at Obafemi Awolowo University Teaching Hospital complex in Nigeria. The outcome indicates that midwives lack skills in monitoring the foetal heart using the cardiotocograph, and 17 babies had low Apgar scores of less than seven at one minute and 19 babies had Apgar scores of less than seven at five minutes (Orji, 2008:250). Keskin, *et al.* (2003:13) report similarly that poor monitoring of the foetal heart with the aid of the cardiotocograph by midwives has resulted in babies born with low Apgar scores lower than 7/10 at one minute and five minutes.

6.8 Carrying out measures in case of caput 2++

The findings reveal that 62% of the midwives perceived themselves to be incompetent in carrying out measures in case of caput 2++. Midwives must have knowledge and skill in performing vaginal examination to identify caput

2++, including the level of the foetal head in the pelvic brim. A caput of 2++ and a foetal head which is still high can be one of the signs of cephalic pelvic disproportion (CPD) (Breen, 2009:30). The presence of caput 2++ usually accompanies poor dilatation of the cervix, poor or prolonged first stage of labour resulting in foetal distress and a baby born with a low Apgar score. Formation of caput and moulding should be reported to the doctor and immediate action may be carried out. Caesarean section should be done without delay as these situations are extremely dangerous to the health of the baby (Sellers, 2001b:1415). No study had cited neonatal outcome in this regard.

In conclusion, a competency level of 100% is expected to be perceived by all midwives in performing critical skills such as the taking and recording of blood pressure correctly, plotting the partogram accurately, performing a vaginal examination during labour, resuscitation of a newborn baby and managing a tight cord around the neck as the majority of babies are born into their hands throughout the birth process. Therefore, all midwives are expected to be clinically skilled and able to bring "woman-centred" practice to life for the best possible outcome for both mother and baby.

7 VALIDITY AND RELIABILITY

Validity is defined as the extent to which a study using a particular instrument measures what it sets out to measure (Burns & Grove, 2001:226). It is concerned with the soundness and the effectiveness of the measuring instrument. In this study, the instrument has been designed to reflect perceived competence of midwives in prevention of low Apgar score amongst the neonates. The data obtained by the instrument reflect perceived competence of midwives. A questionnaire was chosen wherein respondents were requested to respond under questions imposed about their knowledge, skills and ability in the provision of antenatal and labour unit services to a pregnant woman. The questionnaire was appropriately and logically checked by supervisors and changes effected. Content validity was obtained with the independent review by three midwives specialists. 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 relationship between reliability and validity. An instrument which is not valid cannot possibly be reliable (Polit & Hungler, 1999:250). The instrument was subjected to pretesting in order to prevent ambiguous questions and to eliminate errors. Cronbach's alpha test for internal consistency was conducted with the assistance of the statistician. Internal consistency was conducted using the three hospitals. In ensuring reliability in this study, the same tool or instrument was used to three different hospitals and yielded similar results

8 LIMITATIONS OF THE STUDY

- Research was conducted at three hospitals of Vhembe district in Limpopo Province. The study can therefore not be generalised for the entire 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.
- Researchers reached the consensus on the perceived competency level of 65% per item if scored by midwives.

9 RECOMMENDATIONS

Recommendations are 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 and experienced midwives in the maternity unit.
- The set policies, norms and standards that govern the practice of midwifery should be developed and disseminated. For example, the correct use of the partogram the norm for all midwives

practising at clinics, health centres and district hospitals should be emphasised.

- 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 puerperium and neonatal care. This could be in the form of workshops, attending symposiums or in-service courses at the hospitals to maintain and sustain their competency level.

10 CONCLUSIONS

The findings of the study revealed aspects where midwives were competent in performing midwifery skills as well as the areas lacking skills. Lack of skills in performing midwifery skills is of concern because midwives are dealing with two lives, that of the mother and the baby, to prevent maternal and neonatal complications. Therefore, all midwives need to be competent and equipped with knowledge to provide quality midwifery care.

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Competing interest

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