

## **Determinants of Skilled Birth Attendants in Neonatal Resuscitation at Nakuru Level Five Hospital, Kenya.**

### **Authors.**

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### **Abstract.**

This study sought to determine the skills of the birth attendants in neonatal resuscitation at Nakuru Level five Hospital. Prospective study was used to determine the immediate outcomes of neonatal resuscitation where sixty resuscitated new-borns were recruited into the study and followed up for a period of one month. A descriptive cross-sectional study was used to assess the knowledge and skills of skilled birth attendants where thirty six skilled birth attendants were included in the study with various educational level Certificate, Diploma and Bachelors. Self-administered questionnaires were used to assess knowledge while simulated resuscitation using mannequins was used to assess the skills. Multiple linear regressions were used to compare the mean differences. The findings showed that there were a higher number of resuscitated new-borns among prim gravidas, mothers aged below 20 years and referrals cases. Furthermore male new-borns were found to be twice more likely to be resuscitated than female new-borns. There is need to put emphasis teaching of neonatal resuscitation in all pre-service medical institutions to help reduce the noted discrepancies skills. Efforts should be made by the stake holders; both national and county governments to provide refresher courses yearly to all the staff since it has been demonstrated as having impact on the skills of neonatal resuscitation.

**Key Terms:** Neonatal resuscitation, skilled birth attendant.

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## 1.0 INTRODUCTION.

An estimated 90 per cent of births make an easy transition from intrauterine life to extra uterine life. The remaining 10 per cent will need help to establish effective ventilation. Evidence has shown that basic resuscitation involving the use of bag and mask ventilation is sufficient to for most of these babies (6-8%) who could be saved through resuscitation in low resource setting (Zaichkin & Wiswell, 2002). Anticipation and preparation help to organize the appropriate health care team to facilitate neonatal transition and deliver effective resuscitation. (Zaichkin et al., 2011). Nearly 10 million babies require assistance to initiate breathing each year in low resource settings. Between 5-10 per cent of all babies born in facilities require some degree of resuscitation, such as tactile stimulation, airway clearance or positioning. Approximately 3-6 per cent requires basic resuscitation consisting of simple initial step and assisted ventilation". Each year an estimated 814,000 neonatal deaths are related to intrapartum hypoxic events in term infants, previously termed "birth asphyxia", especially in under-resourced settings (Wall et al., 2009). In their study Wall et al ascertained that access to intra-partum obstetric care is poor and the incidence of mortality and burden of long-term impairment from intra-partum related events is highest in low resource settings. This makes need for neonatal resuscitation most urgent.

Globally about one quarter of all neonatal deaths are caused by birth asphyxia. These deaths can be prevented if effective resuscitation is given at birth (Lee, 2011). The International Liaison Committee on Resuscitation (ILCOR) published consensus on science and treatment for neonatal resuscitation. It was however found that those recommendations were not suitable for resource limited settings. The need for clinical guidelines on basic clinical resuscitation suitable for limited resource settings is universally recognized. Studies conducted in six African Countries by National Service provision assessments showed that only 2-12 per cent of personnel conducting births in facilities had been trained on neonatal resuscitation and only 8-22 per cent of facilities had equipment required for new-born respiratory support. (Lawn et al., 2007). It is agreeable that limited health services constitute a major determinant in perinatal mortality" but there is a concern that these deaths could be due to less apparent, potentially preventable factors" (Stanton et al., 2006).

According to WHO it is estimated that each year 99 per cent of neonatal deaths occur in developing countries. Studies done in Malawi 2011 reveal that, nearly 1 in every 4 neonatal deaths is as a result of neonatal asphyxia. Despite efforts by WHO to give guidelines for neonatal resuscitation, Neonatal mortality still has a slow decline. According to (KNBS, 2014), The Kenya Demographic Health Survey revealed that the neonatal mortality rate stood at 27.3/1000 live births. In Nakuru Level 5 Hospital unpublished data, shows

perinatal mortality rate was 68/1000 in a retrospective study conducted between Jan 2004 to Dec 2011. There is a dearth of follow-up data on new-borns who received resuscitation in low resource settings and middle income countries and particularly from community settings as well as a dearth in the outcomes of these resuscitated new-borns. It is a noteworthy concern to find out whether better resuscitation and improvement of care may increase the number of new-borns who survive but are impaired (Little et al., 2010). This study therefore aims to determine the skills of the skilled birth attendants in neonatal resuscitation at Nakuru Level five Hospital.

## **2.0 LITERATURE REVIEW.**

### **Lack of Training, Competency and Maintenance of Resuscitation Skills.**

To reduce potentially harmful practices and achieve effective resuscitation, Health Care providers need to undergo training to improve their competency. A study done in 5 developing countries, by national provision assessments, revealed that about 50 per cent of the health care providers were competent in performing simple resuscitation with bag and mask device while only about 12 per cent were competent in performing complex resuscitation like ventilation, chest compression, endotracheal tube intubation and administration of resuscitative drugs and fluids. These finding underscores the importance of providing effective resuscitation and emphasizes the urgent need to scale up training on neonatal resuscitation. Refresher courses on resuscitation should be given on regular yearly basis so as to prevent loss of skills (Murila et al., 2012). According to American Association of Paediatrics to offer effective resuscitation, there has to be at least one skilled person in every delivery whose sole responsibility is the well-being of the neonate, this may however not be practical in cases where there is shortage of staff or more so in children born at home. According to a village based study done in Indonesia in 2008, as quoted by (Little et al., 2010), concluded that the chance of a baby born in Africa or South Asia to receive resuscitation is very small which is a huge contrast to the care given to a baby born in high income countries.

### **Lack of Equipment.**

Necessary equipment for resuscitation include; ventilation device, suctioning devices and post resuscitation equipment should be made available, functional and clean before every delivery and especially where resuscitation is anticipated. "Difficulty in equipment procurement is a key challenge since those in authority may not be conversant on what to order in terms of the correctly sized self-inflating bag, valve pressure and mask size for neonatal resuscitation" (Bang et al., 2005). The cost of procuring this equipment is undeniably

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another challenge especially in low resource setting facilities.(Bang et al., 2005). Other equipment such as endotracheal tubes, bulb syringes, suction machines, catheters among others are not available in low resource settings thus hampering effective resuscitation. Equipment required for the purpose of training like manikins are unavailable making on-job training unachievable (Little et al., 2010). This is a true picture of most hospitals where manikins may not be found.

### 3.0 METHODS.

A descriptive cross-sectional study was used to assess the knowledge and skills of skilled birth attendants where thirty six skilled birth attendants were included in the study with various educational level Certificate, Diploma and Bachelors. An assessment of the knowledge and skills of skilled birth attendants was conducted. Thirty six skilled birth attendants with varied education levels were enrolled in the study. Self-administered questionnaires were used to assess knowledge while simulated resuscitation using mannequins was used to assess the skills. Multiple linear regressions were used to compare the mean differences. Regression models were applied in determining the factors associated with knowledge and neonatal resuscitation outcomes.

### 4.0 RESULTS AND DISCUSSION.

Skills on Neonatal Resuscitation: The figure below illustrates the neonatal resuscitation skills.



**Fig 1: Preparation for Resuscitation.**

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Majority of the respondents, (82.9%) made sure the equipment was ready for use, 71.4 per cent washed their hands and wore gloves, 68.6 per cent quickly dried and wrapped or covered the new born, 59.6 per cent placed the new-born on back on clean and warm surface while only 41.2 per cent told the mother what was going to be done, listened to her and responded to her questions and concerns as indicated in figure 1.

### Resuscitation Using Bag and Mask.

Table 2 shows the study resuscitation using bag and mask.

**Table 2: Results of the Skill on Neonatal Resuscitation Using Bag and Mask.**

Activity	Frequency (%)
Position head in a slightly extended position.	25(69.4)
If secretions are present; suction first the mouth and then the nose. Avoid routine suctioning.	23(63.8)
If baby not still breathing or breathing is less than 60 b/min start ventilating, recheck position of new-born's head.	23(63.8)
Place correct-sized mask on new-borns face.	29(80.5)
Form a seal between mask and new-borns face, squeeze bag.	25(69.4)
Check seal by ventilating and observing chest rise.	15(41.6)
Observe chest for easy rise and fall.	18(50.0)
Ventilate for 1 minute and then assess if the new-born is breathing spontaneously.	21(58.3)
If breathing is normal, place in skin to skin contact with mother and observe breathing at frequent intervals, encourage mother to begin breastfeeding.	22(61.1)
If new-born is breathing with severe in drawing and breaths <60 start chest compensations at a rate of 3:1-3 chest compression to 1 rescue breath.	21(58.3)
Assess if breathing is > than 60 b/m if not give drugs.	18(50)
If there is no gasping or breathing at all after 20 minutes of ventilation. Stop ventilating. Give psychological support to the mother.	11(30.5)

Majority of the respondents 29 (82.9%) placed the correct size of mask to cover the baby's nose, mouth and chin. Right positioning of the head, forming a seal between the mask and the baby, if secretions are present; suction first the mouth and then the nose. Avoid routine suctioning, If baby not still breathing or breathing is less than 60 b/min start ventilating, recheck position of new-born's head, If breathing is

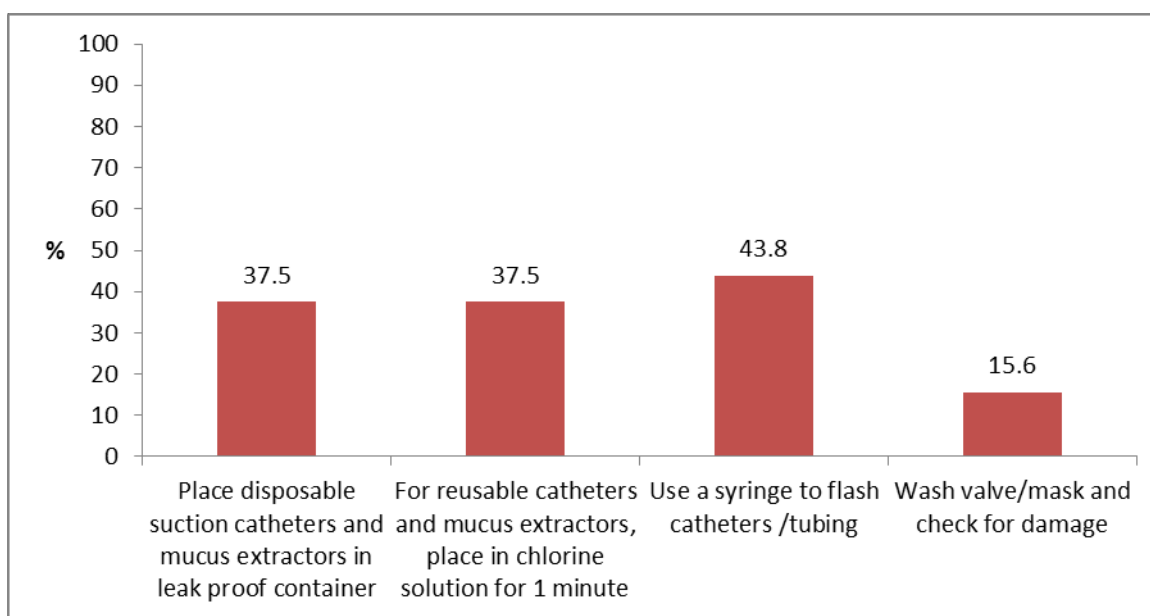
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normal, place in skin to skin contact with mother and observe breathing at frequent intervals, encourage mother to begin breastfeeding was performed by above 60 per cent of the respondents. An average performance was noted in observing the chest for easy rise and fall. If new-born is breathing with severe in drawing and breaths <60 start chest compressions at a rate of 3:1-3 chest compression to 1 rescue breath. Less than average performance was noted in: Checking the seal by ventilating and observing chest rise and if there is no gasping or breathing at all after 20 minutes of ventilation. Stop ventilating. Give psychological support to the mother.



**Fig 2: Post Procedure Tasks**

On post procedure tasks, only 37.5 per cent placed disposable suction catheters and mucus extractors in leak proof container and placed reusable catheters and mucus extractors in chlorine solution for 1 minute. Fourteen (43.8%) used a syringe to flash catheters/tubing while 15.6 per cent washed valve/mask and checked for damage. In summary, slightly more than half 19(52.8%) of the skilled birth attendants reported being competent in performing neonatal resuscitation, while 37 per cent admitted that they felt that they were not competent, and 10 per cent were not sure of their competency. A similar conclusion was drawn

by Murila et al. (2012) in a study conducted in 5 African countries which revealed that only 50 per cent of the skilled birth attendants were competent in performing neonatal resuscitation.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS.

**Conclusion:** Overall this study has revealed that there are several disparities in how neonatal resuscitation is performed owing to gaps in knowledge and skills with competence in performing neonatal resuscitation being reported by only half of the participants. It is further demonstrated in this study that there were a higher number of resuscitated new-borns among primi gravidas, mothers aged below 20 years and referrals cases. Furthermore male new-borns were found to be twice more likely to be resuscitated than female new-borns.

**Recommendation:** There is need to put emphasis teaching of neonatal resuscitation in all pre-service medical institutions to help reduce the noted discrepancies skills. Efforts should be made by the stake holders; both national and county governments to provide refresher courses yearly to all the staff since it has been demonstrated as having impact on the skills of neonatal resuscitation.

## 6.0 REFERENCES.

1. Bang, A. T., Bang, R. A., Baitule, S. B., Reddy, H. M., & Deshmukh, M. D. (2005). Management of birth asphyxia in home deliveries in rural Gadchiroli: the effect of two types of birth attendants and of resuscitating with mouth-to-mouth, tube-mask or bag-mask. *Journal of Perinatology*, 25, S82-S91.
2. KNBS. (2014). *Kenya Demographic Health Survey*.
3. Lawn, J., Kerber, K., Enweronu-Laryea, C., & Masee Bateman, O. (2009). Newborn survival in low resource settings—are we delivering? *BJOG: An International Journal of Obstetrics & Gynaecology*, 116(s1), 49-59.
4. Lee, A.C., Cousens, S., Wall, S.N. et al. (2011). Neonatal resuscitation and immediate newborn assessment and stimulation for the prevention of neonatal deaths: a systematic review, meta-analysis and Delphi estimation of mortality effect. *BMC Public Health*, 11 (12),. <https://doi.org/10.1186/1471-2458-11-S3-S12>.
5. Little, G., Niermeyer, S., Singhal, N., Lawn, J., & Keenan, W. (2010). Neonatal resuscitation: a global challenge. *Pediatrics*, 126(5), e1259-e1260.
6. Murila, F., Obimbo, M. M., & Musoke, R. (2012). Assessment of knowledge on neonatal resuscitation amongst health care providers in Kenya. *Pan African Medical Journal*, 11(1).

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7. Stanton, C., Lawn, J. E., Rahman, H., Wilczynska-Ketende, K., & Hill, K. (2006). Stillbirth rates: delivering estimates in 190 countries. *The Lancet*, 367(9521), 1487-1494.
8. Wall, S. N., Lee, A. C., Niermeyer, S., English, M., Keenan, W. J., Carlo, W., & Ariawan, I. (2009). Neonatal resuscitation in low-resource settings: what, who, and how to overcome challenges to scale up? *International Journal of Gynecology & Obstetrics*, 107, S47-S64.
9. Zaichkin, J. & Wiswell, T. (2002). The History of Neonatal Resuscitation. *Neonatal network* : NN. 21. 21-8. 10.1891/0730-0832.21.5.21.