COMPLIANCE WITH WORLD HEALTH ORGANISATION NEONATAL RESUSCITATION GUIDELINES BY MEDICAL DOCTORS AND MIDWIVES IN KITWE DISTRICT HEALTH FACILITIES, ZAMBIA

By

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DECLARATION

I **Juliet Kasanga Munganga** hereby declare that the work presented in this study for Master of Science Degree in Nursing has not been presented either in wholly or part for any other Degree and is not being submitted to any other degree.

Signed……..... Date ……

(Candidate)

Approved …… Date……

(Supervisor)

CERTIFICATE OF COMPLETION OF DISSERTATION

I hereby certify that this study is entirely the results of my own independent investigations. The various sources to which I am indebted are clearly indicated in the text and references.

Signed …….. Date ……

Supervisor……... Date ……

CERTIFICATE OF APPROVAL

The University of Zambia approves this dissertation of **Juliet Kasanga Munganga** in partial fulfilment of the requirements for the award of the Degree of Masters of Science in Nursing.

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Examiners signature……Date……

DEDICATION

To my father (Mathews Kasanga), mothers (Sophia Moomba and Jessie Mutinta) and my brothers (Chiwisa and Daniel Kasanga) all deceased for the inspiration and confidence they had in me to excel in my studies.

My daughter Faith Fwapyeka, sisters Mirriam Ngulale and Sophia Wakumelo, niece Elizabeth Mwendalubi, nephews Matthews Kasanga, Frank Kasanga and Nsaishi Ngulale whose patience and support gave me the impetus to move on with my studies.

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ABSTRACT

Neonatal resuscitation is used in the management of neonates with birth asphyxia and respiratory distress few hours after birth. The popularity of neonatal resuscitation is increasing in the decade with the introduction of Helping Babies Breath (HBB) and Emergency Obstetric and New-born Care (EmONC) trainings. This study was aimed at determining compliance with the World Health Organisation (WHO) neonatal resuscitation guidelines and its related factors by medical doctors and midwives in Kitwe District Health delivery facilities.

A descriptive cross sectional study design was used. Purposive sampling method was used to select the appropriate sample. A total number of 5 medical doctors and 81 midwives from Kitwe Central Hospital and Kitwe District Health delivery facility answered a self-administered questionnaire. Twenty (20) participants out of the 86 respondents were observed conducting resuscitation using the observation checklist that was adopted from Essential Newborn Care training guide by World Health Organisation.

Data was analysed using the SPSS version 20.0 software and was presented in the form of frequency tables and cross tabulation, pie charts and bar charts to communicate the results easily. Chi- square test was used to test the associations between the dependant and independent variables. The factors associated with compliance were analysed using the multivariate binary logistical regression model. A 5% level of significance was set and p-value of 0.05 or less was considered statistically significant.

This study revealed that 82.6% of the respondents did not comply with WHO neonatal resuscitation guidelines and 79 % of the respondents had moderate knowledge on neonatal resuscitation. The findings showed that 69.8% of the respondents had positive attitude towards neonatal resuscitation. On the availability of equipment, the study showed that 66% of the equipment was available. Further the study revealed that 84.9% of the respondents did not attend any in house training.

The findings showed no significant association between compliance with the WHO neonatal resuscitation with the level of knowledge on neonatal resuscitation, attitude of medical doctors and midwives and availability of neonatal resuscitation equipment.

However, the study revealed a significant association between compliance with the WHO neonatal resuscitation guidelines and in house training. There is need, therefore, to consider roaring out in house training on neonatal resuscitation in order to improve compliance with WHO neonatal resuscitation guidelines.

Key Words: Compliance, World Health Organisation, Neonatal resuscitation, Guidelines

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LIST OF ABBREVIATIONS

A	:	Attitude
BI	:	Behaviour Intention
CNST	:	Clinical Negligence Scheme for Trust
CPR	:	Cardiopulmonary Resuscitation
DOH	:	Department of Health
EMoNC	:	Emergence obstetrical and Newborn Care
ENC	:	Essential Newborn Care
GNC	:	General Nursing Council
HBB	:	Help Baby Breath
HIE	:	Hypoxic Ischaemic Encephalopathy
ICM	:	International Confederation of Midwives
LiST	:	Lives Saved Tool
MAS	:	Meconium Aspiration Syndrome
MASF	:	Meconium Aspiration Stained Fluid
NICU	:	Neonatal Intensive Care Unit
NRP	:	Neonatal Resuscitation Program
NRPG	:	Neonatal Resuscitation Program Guideline
PATH	:	Program for Appropriate Technology in Health
QA	:	Quality Assurance
RR	:	Relative Ratio
SN	:	Subject Norm
TR	:	Traditional Resuscitation

TRA	:	Theory of Reasoned Action
USA	:	United States of America
WHO	:	World Health Organisation

CHAPTER ONE

1.0 INTRODUCTION

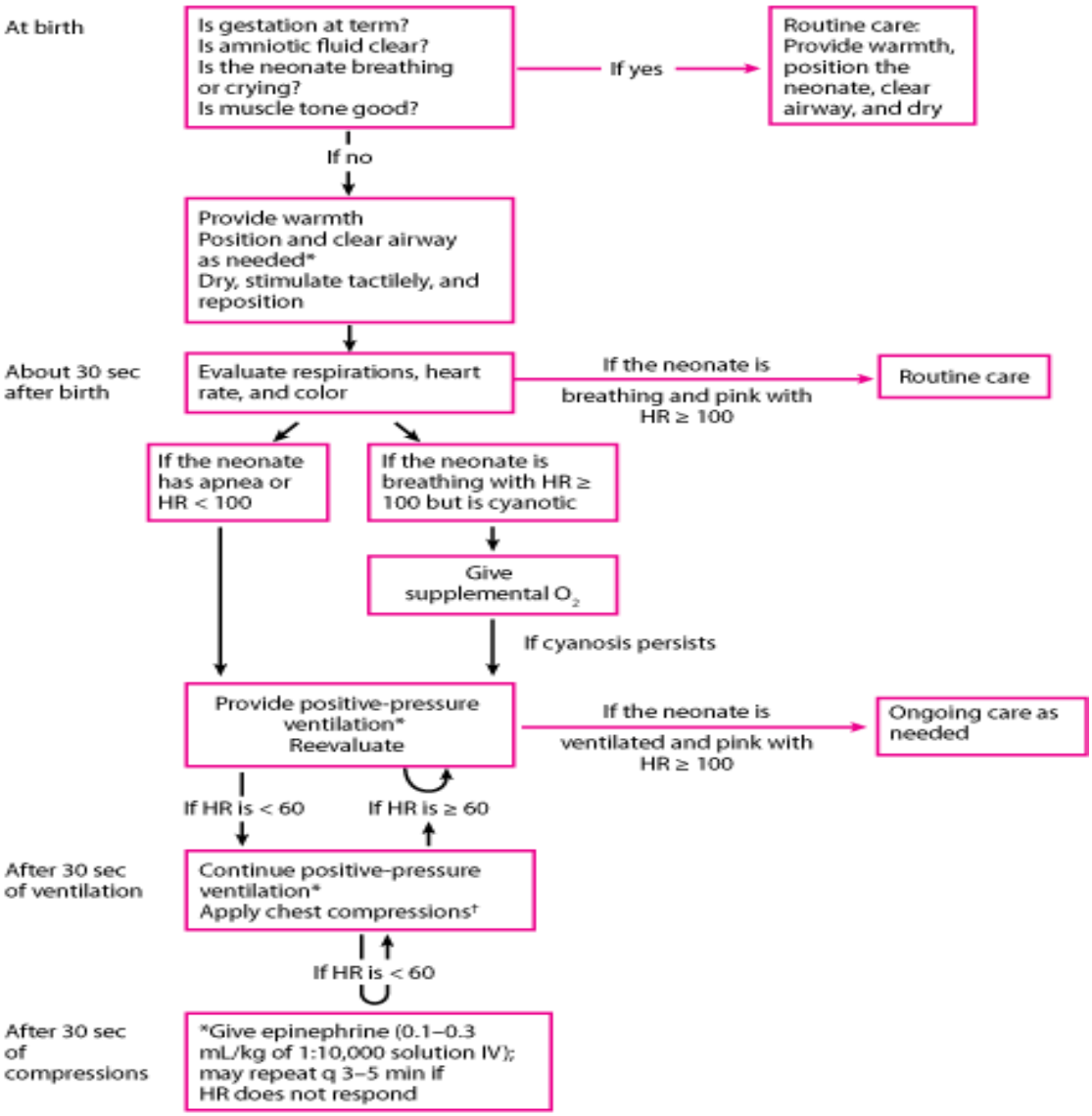
1.1. BACKGROUND

Neonatal resuscitation is an essential skill required for all health care providers including midwives conducting deliveries of neonates (Robin, 2011). It constitutes an important aspect of midwifery practice comprising a series of actions that are taken in order to revive a neonate at birth to initiate and maintain normal respiration. The World Health Organisation (WHO, 2010) states that by following a simple A (airway), B (breathing) and C (circulation) approach, it should be possible to provide resuscitation with simple equipment and minimal skills. The main objective for conducting neonatal resuscitation is to obtain a normal respiratory rate and pattern, a normal heart rate, blood pressure, colour and a normal general activity level. This objective must be achieved within seven (7) minutes of birth in order to prevent cerebral damage that may result in cerebral palsy and in the long term result in handicap (Sellers, 2007).

Barber (2006) states that approximately 10% of newborns require some assistance to begin breathing at birth. Less than 1% require extensive resuscitative measures. Between 5% and 10% of all neonates born in facilities need some degree of resuscitation, such as tactile stimulation or airway clearing or positioning and approximately 3%–6% require basic neonatal resuscitation, consisting of these simple initial steps and assisted ventilation (Zhu, 1997). Quite often, babies that require resuscitation are not effectively resuscitated especially in developing countries (Kamenir, 1997). In many developing countries, effective newborn resuscitation is seen as complex procedure dependent on the presence of (relatively) expensive technology making it ‘out of reach’ for low-income health systems (Kamenir, 1997).

Neonatal resuscitation is often not initiated in most cases of asphyxia, or the methods used are inadequate or wrong. This is especially true in the developing world, which accounts for 98% of the 4 million neonatal deaths (WHO, 1997). Neonatal resuscitation is a simple, inexpensive, readily available, and cost-effective intervention that can prevent many of the deaths and reduce disabilities in survivors from birth asphyxia (Deorari, 2001).

In order to address the problem of birth asphyxia in developing countries, the WHO designed a program called Essential Newborn Care (ENC). ENC is designed to set minimum infant care standards for resource-poor countries and to educate and train midwives and birth care providers on evidence-based guidelines for newborn care (WHO, 2010). Zambia, through the Ministry of Health has adopted the ENC care program. The program includes the use of the WHO standardised algorithms in neonatal resuscitation in order to reduce neonatal mortality that occurred within the first week of life. An algorithm is a step by step method of solving a problem or making a decision as in making a diagnosis. It has the following properties: Finitive – it can be terminated after a finite numbers of steps; Definiteness – the action specified by the steps can not be interpreted in multiple ways and could be performed without any confusion; Input – an algorithm accepts zero or more inputs; Output – it produces at least one outcome; Effectiveness – it consists of basic instructions that are realizable meaning that the instructions can be performed by using the given inputs in a finite amount of time (Koneti, 2016).



*Endotracheal intubation may be considered at any of several steps.
†Reassess heart rate about every 30 sec. Continue chest compressions until the spontaneous HR is ≥ 60 beats/min.

Source: International Journal of Gynaecology and Obstetrics 107 (2009) S47=S64

FIGURE 1: NEONATAL RESUSCITATION ALGORITHM

Figure 1 shows the set of steps on Neonatal resuscitation that medical doctors and midwives require to undertake when conducting resuscitation.

Kitwe District Health care facilities are not an exception to this plan. It is therefore pertinent that the execution of this very delicate procedure is assessed in order to establish the extent to which the doctors and midwives complied with neonatal resuscitation.

WHO Standard of Operation on Neonatal Resuscitation

The need for clinical guidelines on basic newborn resuscitation, suitable for settings with limited resources was universally recognised and the WHO responded by developing the document titled Basic newborn resuscitation: a practical guide. As this document was over a decade old, a process to update the guidelines on basic newborn resuscitation was initiated in 2009. The International Liaison Committee on Resuscitation (ILCOR) published Consensus on Science and treatment recommendations for neonatal resuscitation in 2000, 2005 and 2010. Regional resuscitation councils published guidelines based on the ILCOR consensus which were not designed for resource-limited settings (WHO, 2012)

The objective of the basic newborn resuscitation was to ensure that newborns that required resuscitation are effectively resuscitated. These guidelines were incorporated in WHO training and reference materials, such as Pregnancy, childbirth, postpartum and new-born care: a guide for essential practice; Essential new-born care course; Managing new-born problems: a guide for doctors, nurses and midwives; and Pocket book of hospital care for children: guidelines for the management of common illnesses with limited resources. The following are the recommendations in the updated WHO neonatal resuscitation guidelines:-

A) Immediate Care of the New-born

The new guidelines recommend that newly-born term or preterm babies who do not require positive-pressure ventilation, the cord should not be clamped earlier than one minute after birth. It also states that newly-born babies who do not breathe spontaneously after thorough drying should be stimulated by rubbing the back 2-3 times before clamping the cord and initiating positive-pressure ventilation. Suctioning of the mouth and nose should not be performed on neonates born through clear amniotic fluid who started breathing on their own after birth. In the presence of meconium-stained amniotic fluid, intrapartum suctioning of the mouth and nose at the delivery of the head is not recommended. Furthermore the guidelines do not recommend tracheal suctioning in neonates born through meconium stained amniotic fluid. In settings where mechanical equipment to generate negative pressure for suctioning is not available and a newly-born baby requires suctioning, a bulb syringe (single-use or easy to clean) is preferable to a mucous extractor with a trap in which the provider generated suction by aspiration.

B) Positive-Pressure Ventilation

The WHO resuscitation guidelines (2012) further recommend that newly-born babies who do start breathing despite thorough drying and additional stimulation, positive-pressure ventilation should be initiated within one minute after birth. In newly-born term or preterm (>32 weeks gestation) babies requiring positive pressure ventilation, ventilation should be initiated with air. Furthermore, it states that newly-born babies requiring positive-pressure ventilation, ventilation should be provided using a self-inflating bag and mask interface. The baby should be assessed by measurement of heart rate after 60 seconds of ventilation with visible chest movements. For the babies that do not start breathing within one minute after birth, the priority should be given to providing adequate ventilation rather than chest compressions.

C) Stopping Resuscitation

The WHO resuscitation guidelines recommend that newly-born babies with no detectable heart rate after 10 minutes of effective ventilation, resuscitation should be stopped.

Pre-Requisites for Neonatal Resuscitation

Kattwinkel et al. (2010), states that being prepared is the first and most important step in delivering effective neonatal resuscitation. The need for resuscitation is not anticipated in most infants who require resuscitation. As a result, at every birthing location, personnel who were adequately trained in neonatal resuscitation should be readily available to perform neonatal resuscitation whether or not problems are anticipated. In all instances, at least one healthcare provider is assigned primary responsibility for the newborn infant. This person should have the necessary skills to evaluate the infant, and, if required, to initiate resuscitation procedures such as positive pressure ventilation and chest compressions. In addition, either this person or another who is immediately available should have the requisite knowledge and skills to carry out a complete neonatal resuscitation including endotracheal intubation and administration of medications (Mitchell, 2002). Equipment needed for basic resuscitation should be available at every delivery area such as Self-inflating Bag and Mask Devices, Suction Devices
(Bulb / penguin sucker).

1.2 STATEMENT OF THE PROBLEM

In Zambia Medical Doctors and Midwives acquire knowledge and skill on resuscitation of the neonate during the basic training. Further, WHO embarked on training the mentioned professionals in Emergency Obstetric and Neonatal care and helping babies breath from 2006 and is still ongoing. Despite the training, the neonatal mortality rate is still high (34/1,000) in Zambia. Kitwe Central Hospital also recorded a high neonatal mortality (209) out of the total 2,502 deliveries in 2011 and 124 neonatal mortality out of the 1,560 deliveries in 2012 though the statistics for 2012 were incomplete.

Furthermore, between 2011 and 2012 neonatal mortality resulting from asphyxia had increased from 27% to 46.5 % (KCH Statistic Unit 2011-2012).

A total of 194 neonates were resuscitated in 2011 and out of this, 53 (27%) neonates died and in 2012, 204 neonates were resuscitated of which, 95 (46.5%) neonates died showing an increase of 19.5%. Similarly, Lawn (2005) states that in low income countries, particularly South Asia and Sub Saharan Africa accounted for two thirds of the world's neonatal deaths. This was not in line with the WHO 2000 campaign that states that no child should die before the fifth birthday. Furthermore, Kitwe district health institutions had not evaluated compliance with the WHO neonatal resuscitation guidelines and it was not known whether medical doctors and midwives comply with the set guidelines of the WHO neonatal resuscitation. In view of this, the study was undertaken in order to establish if at all there was any discrepancy.

1.3 THEORETICAL FRAMEWORK

Nursing theory is an 'articulated and communicated conceptualization of inverted or discovered reality in or pertaining to nursing for the purpose of describing, explaining, predicting or prescribing nursing care' (Basavanthappa, 2007). In an attempt to understand compliance with neonatal resuscitation guidelines by the medical doctors and midwives in Kitwe district health facilities, the Theory of Reasoned Action and the Theory of Planned Action were used.

1.3.1 THEORY OF REASONED ACTION (TRA)

The TRA is a model for the prediction of behaviour intention, spanning predictions of attitude and predictions of behaviour. The subsequent separation of behaviour intention from behaviour allowed for explanation of limiting factors on attitudinal influence (Ajzen, 1980). The TRA was developed by Martin Fisbein and Icek Alzen (1975, 1980).

Predicted relationship

The key application of the theory of reasoned action is prediction of behavioural intentions, spanning predictions of attitude and prediction of behaviour among the medical doctors and midwives. This theory provides some empirical understanding on some of the potential influencing factors on certain behaviours such as knowledge, training and attitude influencing compliance with neonatal resuscitation.

1.3.1.1. KNOWLEDGE

The TRA states that knowledge is a cardinal motivational factor that influences specific behaviour and that it is one of the best predictor of behaviour (Dyke, 2008). This theory stipulates that knowledge (subjective norm) is seen as a combination of perceived expectation from relevant individual or group along with intentions to comply with these expectations. The person's perception that most people who are important to him or her think he or she should not perform the behaviour in question (Fishbein and Ajzen, 1975).

In this study, knowledge attained by the medical doctors and midwives from their educational institutions will motivate them to comply with neonatal resuscitation guidelines.

1.3.1.2. TRAINING OF MEDICAL DOCTORS AND MIDWIVES

This theory states that behaviour intention measures a person's relative strength of intention to perform behaviour and that perceived behaviour control indicates a person's perceived ability to carry out a specific behaviour successfully (Fishbein and Ajzen, 1975). They further indicate that this can be attained through formal training. The training that the medical doctors and midwives attained could have some influence on conducting neonatal resuscitation.

1.3.1.3. ATTITUDE

Fishbein and Ajzen (1975) states that attitude consist of a person's beliefs about the consequence of performing the behaviour multiplied by his or her evaluation of these consequences. Attitude towards performing a specific behaviour results from a positive or negative evaluation of the outcome of the behaviour.

The medical doctors and midwives' perceived norms or normative influence could have been as a result of wrong things done by workmates.

According to Ajzen (1985) the Theory of Planned Behaviour looks at the link between attitudes and behaviour. He stated that behaviour control can be placed over the opportunities, institutional resources and skills that may be necessary for the medical doctors and midwives to comply with neonatal resuscitation guidelines effectively. If the medical doctors and midwives were availed with institutional resources compliance with the set guidelines of neonatal resuscitation would be enhanced.

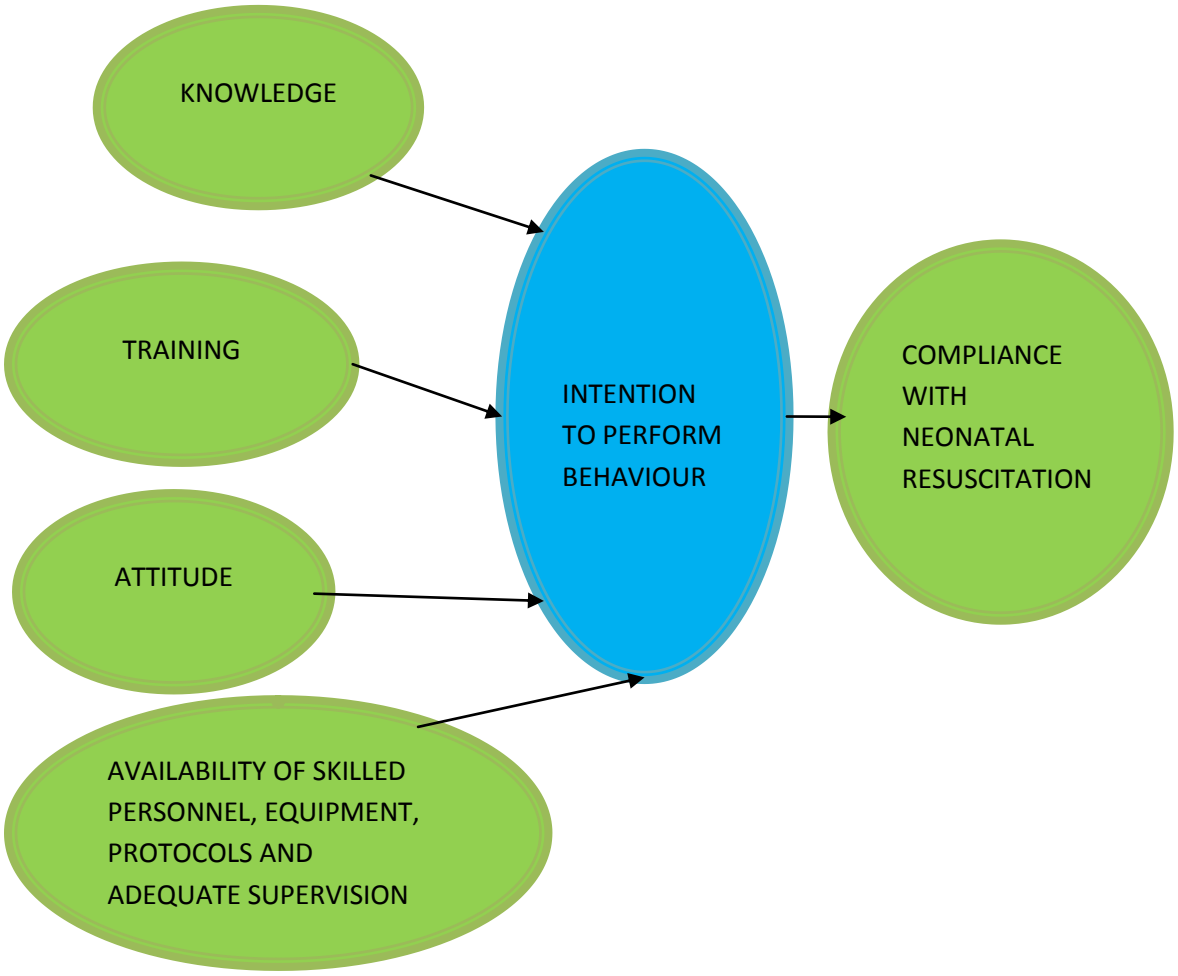


Figure 2: Modified diagram of theoretical framework (TRA)

1.4 JUSTIFICATION

Neonatal resuscitation has been performed in the past with difficulties. With a lot of advancement in nursing and obstetric practice, a lot of improvements have been made to facilitate the resuscitation of the new born at the time of delivery (Erika M.E., et al 2015) Midwives and medical doctors have undergone additional training in emergency obstetric and new born care in which resuscitation of the new born is a component. Despite the trainings that health care providers have undertaken, compliance with neonatal resuscitation is still a challenge in these health facilities.
The results of this study provided useful information on compliance with neonatal resuscitation. It provided information to health personnel like the medical doctors, nurse midwives and anaesthetist, policy makers among others to evaluate and improve the neonatal resuscitation services that are provided. It also helped to identify the several factors that affected compliance with neonatal resuscitation. It also opened up avenues for future research to be conducted on a large scale on neonatal resuscitation in Zambia.

1.5 RESEARCH QUESTION

Do the medical doctors and midwives comply with the WHO neonatal resuscitation guidelines?

1.6 OBJECTIVES

1.6.1 General Objective

To determine whether medical doctors and midwives in Kitwe district health facilities comply with WHO neonatal resuscitation guidelines.

1.6.2 Specific Objectives

In order to achieve the general objective, the following specific objectives were considered:

1. To assess the level of knowledge of medical doctors and midwives on neonatal resuscitation.

2. To assess the attitude of medical doctors and midwives towards neonatal resuscitation procedure.
3. To assess the availability institutional resources to enhance compliance.
4. To assess the adequacy of in house refresher course on neonatal resuscitation.
5. To assess compliance with the WHO neonatal resuscitation guidelines of medical doctors and midwives.
6. To identify the factors that influence medical doctors' and midwives' compliance with WHO neonatal resuscitation guidelines.

1.7. HYPOTHESIS

There is an association between compliance with the WHO neonatal resuscitation guidelines and

1. Knowledge of medical doctors and midwives on neonatal resuscitation,
2. Training of medical doctors and midwives,
3. Attitude of the medical doctors and midwives towards neonatal resuscitation
4. The availability of resuscitation equipment and protocols.

1.8 CONCEPTUAL DEFINITION

Neonatal resuscitation "is a series of actions that are taken in order to revive a newborn infant so that normal respiration may be initiated and maintained" (Sellers, 2007).

Neonate: "is the infant less than four weeks" (Sellers, 2007).

Compliance "is either a state of being in accordance with established guidelines specifications or legislations or the process of becoming so" (Margaret, 2010).

Midwife “a person who, having been regularly admitted to a midwifery educational program, duly recognised in the country in which, has successfully completed the prescribed course of studies in midwifery and has acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery” (ICM, 2005).

Guideline “rules or instructions that are given by the official organization telling you how to do something especially something difficult” (Hornby, 2006).

Apgar score “is a numeric expression of the condition of a new born obtained by rapid assessment at 1 and 5 minutes of age developed by Dr. Virginia Apgar” (Lowdermill, 2006).

Hypoxia “is insufficient availability of oxygen to meet the metabolic needs of the body tissues” (Sellers, 2007).

Perinatal mortality rate “is the total number of infants who have died in the first week of life and includes the number of still births, in a particular year out of every 1000 live birth and stillbirth in that year” (Sellers, 2007).

Neonatal Mortality Rate “is the total number of infants who died during the first month of life in a given year out of every 1000 birth for a particular year” (Sellers, 2007).

Knowledge is “the information, understanding and skills that you gain through education or experience” (Hornby, 2006).

1.9 OPERATIONAL DEFINITION OF THE STUDY VARIABLES

Compliance

Compliance is the ability of the participants to follow the cardinal steps of resuscitation outlined on the check list. In this study compliance with neonatal resuscitation steps was measured by observing participants demonstrating resuscitation using an observation checklist.

The checklist comprised a series of steps arranged in a sequence that a respondent was expected to do in order to successfully resuscitate a neonate. The elements of the steps were assigned a score and the total score for the whole procedure was 36. Compliance was equated to a score of 27 to 36 (75 – 100%), non-compliance with score of 0 to 26 (0 – 74%).

Knowledge

In this study knowledge was defined as the information the medical doctors and midwives have and know on resuscitation guidelines and their ability to follow the guidelines correctly**.** Knowledge of neonatal resuscitation was ascertained by the use of the self-administered questionnaire which comprised questions that focused on the knowledge of medical doctors and midwives on the neonatal resuscitation procedure. Knowledge questions appear in section B of the self-administered questionnaire. The observation checklist will also help to measure knowledge on the procedure. The total score was 19. Knowledge was assessed using a scale of high knowledge with sores of 14-19, medium knowledge with scores of 9 - 14 and low knowledge with a score of 8 and below.

Attitude

Attitude was defined as the way the medical doctors and midwives perceive the neonatal resuscitation guidelines. Attitude of medical doctors and midwives towards neonatal resuscitation procedure was measured by using a Likert scale to rate the individual's attitude towards neonatal resuscitation. The likert scale is named after Dr. Rensin Likert a sociologist at the University of Michigan. In his original report entitled "A technique for the measurement of attitude in 1932" Dr Likert wanted to develop a means of measuring psychological attitude in a scientific manner. The scale measure uses numeric, nominal and a point Likert-type response scale. Likert-type scales will be used with responses ranging from strongly agree to strongly disagree (from 5,4….1) depending on the construct being measured. The scales measured subjective response on compliance. The Likert scale appeared in section C of the self-administered questionnaire. The total score in this section was 7. Attitudes was also be classified according to positive (scores of 4-7) and negative (scores of 3 and below).

Availability of neonatal resuscitation equipment

Availability of neonatal resuscitation was defined as having about seventy-fifty (75%) percent of the equipment. This was measured by using an observation checklist. The number of resuscitation equipment that was present in the clinical area was ticked on the checklist. The total score from the checklist was 100%. Non availability was indicated by the score of less than seventy – five (75%) percent. Furthermore the interview schedule had question to assess the availability of equipment in section E. The total number of scores in this section was 4. The score of one (1) to two (2) indicated non availability while the score of three (3) to four (4) indicated availability of equipment.

1.10 STUDY VARIABLES AND CUT OFF POINTS

VARIABLE

A variable is a characteristic or attribute of a person or object that varies (Polit and Hungler, 1997).

DEPENDANT VARIABLES

Compliance with neonatal resuscitation

INDEPENDENT VARIABLES

a. The level of knowledge on neonatal resuscitation
b. The attitude of staff towards neonatal resuscitation
c. The availability of neonatal resuscitation protocols and equipment.

Table 1: Research variable, cut off points and indicators

Variable	Type of variable	Scale of Measurement		Question No.
		Indicators	**Cut off points**	
Dependent				
Compliance with neonatal resuscitation	Dichotomous	Compliant	Scored 75 - 100% in all the selected questions	33 – 44
		Non - compliant	scores below 75 % in all the selected questions	
Independent				
Knowledge	Ordinal	High	Scores of 11- 14 on knowledge questions	7 – 18
		Medium	Scores of 10 -7 on knowledge questions	
		Low	Scores of 6 and below on knowledge questions	
Attitude of midwives and doctors	Dichotomous	Positive	Scores of 3 - 6 on the attitude questions	19 – 25
		Negative	Scores of 2 and below on attitude questions	
Availability of resuscitative equipment	Ordinal	Available	75% - 95% listed equipment available	29 – 32
		Not available	Less than 75% of the listed equipment available	
Availability of the Protocols	Dichotomous	Available	Neonatal resuscitation protocols found and stuck to the wall in the resuscitating room	33, 36
		Not available	Neonatal resuscitation protocols not found in the resuscitating room	

CHAPTER TWO
2.0 LITERATURE REVIEW

2.1 INTRODUCTION

In this study, literature review was sourced from the books, journal articles, abstracts, published conference proceedings, research reports and institution guidelines that are mostly derived from WHO. The focus of the literature review in this study was on compliance with neonatal resuscitation by the medical doctors and the midwives. The literature was therefore organised according to the TRA Model constructs which are compliance, knowledge, skill and training. The variables are discussed below.

2.2 COMPLIANCE WITH WHO NEONATAL RESUSCITATION GUIDELINES

Neonatal resuscitation is a simple but complex procedure if done without prior mastering of the steps**.** Patel, Posencheg and Ades (2012) conducted a study entitled “proficiency and retention of Neonatal Resuscitation skills by Paediatric residents” in Philadelphia. This study aimed at assessing the retention of skills by paediatrics residents. The basic knowledge and skill base to resuscitate a newborn infant was taught in the National Resuscitation Program. The study hypothesised that care givers would perform below current acceptable standard before the recertification period of two years. The prospective descriptive study was conducted to evaluate performance of Paediatric resident’s NRP knowledge and skill over time.

In this study, eighty-eight subjects completed both evaluations. The study revealed that Knowledge scores were maintained close to passing throughout the academic year. The subset evaluation revealed that there were significant deficits within the intubation lesson. Additionally, there were alarming deficits seen in skill evaluation starting at the initial NRP certification with 39.1% residents having failing scores. The mean scores were below passing for every group on follow-up test. The study concluded that deterioration of skills was seen shortly after training. It appeared that knowledge was generally better retained. Discrepancies between areas of knowledge and skill deterioration indicated that proficiency in one did not necessarily indicate proficiency of the other.

Therefore, there is need to balance the knowledge and skill in order to be proficient in both. If the medical doctors and midwives were constantly monitored in terms of hands on the neonatal resuscitation procedure their skill would not deteriorate within a short period of time.

Carbine et al. (2000) conducted a study as means of evaluating compliance with neonatal resuscitation program guidelines in the department of paediatrics in the USA. The application of National Resuscitation Program (NRP) guideline and resuscitation skills in actual setting was undocumented. A video recorder was mounted to the radiant warmer in the main Obstetrical Operating room to record all high risk resuscitations. In this study, the first 100 resuscitations were evaluated to assess NRP compliance. Each step in the resuscitation (positioning, oxygen delivery, ventilation, chest compression, intubation and medication) was graded. A score was devised with 2 points being awarded for every correct decision and proper procedure. 1 point for delayed intervention or inadequate technique, and zero point for indicated procedures that were omitted or for interventions that were not indicated.

The results indicated that forty-four percent of 100 resuscitations had deviations from the NRP guidelines. Ten percent had overly received aggressive simulation and 22% had poor suction technique. Of the 78 infants given oxygen, this decision was considered incorrect in 15% of 78 and the delivery technique was poor in 10% of 78 infants that were given oxygen. Of those that required mask ventilation, 11% used an incorrect rate, and 17% had inadequate re-evaluation. Twelve infants were intubated. Only 7 of 20 were successfully intubated on the first attempt and only 4 of 20 were intubated in <20 seconds. The longest intubation attempt was 50 seconds. This study concluded that there were some significant numbers of deviations from the NRP guidelines. Video recording of actual clinical practice was a useful Quality Assurance (QA) tool for monitoring the conduct of newborn resuscitation. A repeat video assessment of individual NRP providers was being conducted to determine whether there was improved performance. The use of the video to record the actual practice brought out a lot of deviations which could have been missed if the direct observation approach was used.

Another study entitled “Use of Naloxone during neonatal resuscitation in Australia: compliance with the published guideline”, was conducted by Gill and Colvin (2007). The aim of the study was to describe the use of Naloxone during neonatal resuscitation in Australia and to assess this against the published guidelines for use.

A total of 531 058 live born infants from 1994 through 2004 were assessed. The study revealed that the administrations of Naloxone fell from 4% to 1% of live born infants during the stated period. Additionally, there was inconsistent compliance with published guidelines. It also revealed that forty – two percent of infants received Naloxone without documentation of prior ventilation support. Fourteen percent of infants received Naloxone without prior administration of maternal narcotics and eighty percent of infants were not monitored following Naloxone administration. The prevalent route of administration was intramuscular. The conclusion of this research was that despite a steady decrease in the use of Naloxone for neonatal resuscitation, there was a considerable lack of compliance with the published guidelines for the use of Naloxone. If the medical doctors and midwives received constant updates on the use of Naloxone during resuscitation, they would be reminded not to administer the drug to the neonate without their mothers receiving pethidine. It is clear that the medical doctors and midwives’ knowledge was not translated into their practice.

A study was conducted to determine midwives adherence to guidelines on management of birth asphyxia at Queen Elizabeth Central Hospital in Blantyre district, Malawi. A structured questionnaire was used to collect data on participant’s demographic characteristics and midwives’ comprehension of birth asphyxia and an observational check list was used to observe midwives’ adherence to WHO resuscitation guidelines. The findings indicated that the midwives had knowledge of birth asphyxia in general. However, there were gaps in their ability to identify warning signs of birth asphyxia through partograph use. In addition the midwives did not adhere to 9 out of the 21 steps of the resuscitation guideline. Generally there was substandard adherence to guidelines on identification of warning signs of birth asphyxia and neonatal resuscitation.

On the other hand, the facility did not have adequate resuscitation equipment and supplies (Chikuse, 2012). The observational checklist is a good tool that helps to elicit the performance of the midwives. Therefore, it was recommended to be used in the current study to determine compliance with the WHO neonatal resuscitation guidelines in Kitwe district. Secondly the study was undertaken in order to assess the situation in Zambia as the country shared the similar characteristics in region.

2.3. KNOWLEDGE ON NEONATAL RESUSCITATION

ZHU, 1997 conducted a study in China on the impact of Neonatal resuscitation program guideline (NRPG) on neonatal mortality in hospital in Zhuhai. A perspective study of 4,751 newborns with 366 asphyxiated babies in a period of 2 years was carried out. A previous sample of 1,722 live births under the TR program was compared as a controlled group statistically. The study was aimed at replacing the traditional resuscitation (TR) program in 1993. TR has been in existence in China for a long time. The implementation of NRPG was timely in reducing the number of infant mortality and was also used to disseminate information to the many hospitals in China which were still practising TR.

The study results revealed that only 16 newborns died within 7 days, out of 4,751 births (3.4%) with 2 deaths in the delivery room. Seventeen newborns died within 7 days out of 1,722 births in the TR group, with 10 deaths in the delivery room. From the data shown, it was clearly seen that perinatal /neonatal mortality rate were reduced almost 3 times after NRPG was implemented. The follow-up results of 21 cases of severe asphyxia at 2 months and 1 year of age were normal except for one baby who had cerebral palsy. The study showed that NRPG was indeed a very effective and feasible technique during the delivery process in the reduction of neonatal mortality. The study concluded that it was important to disseminate widely the knowledge and technique of NRPG in places where TR was still being widely practiced especially in developing countries. It would be better to conduct the study using this methodology in order to follow up all the midwives and medical doctors who have undergone training on neonatal resuscitation. This would help to determine whether they are implementing the new trends in neonatal resuscitation. The sample size that was used in this study was big enough to allow the results to be generalised.

Murila (2012) conducted a study entitled Assessment of knowledge on neonatal resuscitation amongst health care providers in Kenya. This study revealed a disappointing performance of health personnel in this essential skill, underscored the urgent need for intensified training. Increasing the duration and quality of formal training was to be considered during the pre-service medical education to ensure acceptable neonatal outcome. This implies that more time should be devoted to practice in order enhance good performance. The training instruction should allocate more clinical hours than the classroom hours in order to ensure acquisition of neonatal resuscitation skills.

Another study conducted in Ethiopia found that the recent performance on neonatal resuscitation and geographic region were strongly predictors of providers' knowledge but it did not assess how well providers' knowledge translated into practical skills (Haile-Mariam, 2012). The assumption to this observation could be that knowledge had an impact on the skills transformation by health personnel. If the medical doctors and midwives had theoretical knowledge on neonatal resuscitation their resuscitation skills would be good and they would easily comply with the WHO neonatal resuscitation guidelines. Therefore, the researcher aimed at investigating the extent to which medical doctors and the midwives complied with WHO neonatal resuscitation guidelines in Kitwe District Health facilities.

2.4. TRAINING ON NEONATAL RESUSCITATION

Training courses in neonatal resuscitation could effectively increase the competency of health workers in conducting neonatal resuscitation and reduce potentially harmful practices. Several training tools and materials were available to assist training courses. Active monitoring of competency must be emphasized. In a study conducted by Patel, Piotrowski et al. (2001) in USA on the effect of a state-wide neonatal resuscitation training program on Apgar scores among high-risk neonates in Illinois. A retrospective 3-time period cohort design was used (before the introduction of National Resuscitation Program (NRP), 1985-1988, transition when NRP training occurred,1989-1990 and after NRP training was completed at least once for some delivery room personnel in each Illinois hospital,1991 – 1995).

In this study, a total of 639,429 high risk birth records were selected from detailed analysis out of 2,007,533 births in Illinois between 1985 and 1995 for 193 hospitals. The number of active NRP instructors in Illinois changed dramatically during the study period, for example 1 to 6 between 1987 and 1988 to 1096 to 1242 between 1991 and 1995. The percentage of neonates reported to have low (<7) 1- minute Apgar score decreased in 1991 to 1995 overall and for each of 4 hospital levels, overall and by hospital level, there was a statistically significant lower proportion of high risk newborns who showed a decreased or no change in their 5-minutes Apgar score after the NRP instruction. After adjusting from several material characteristics, logistic regression analysis revealed that the high risk newborns were more likely to increase their 5-minute Apgar score after the NRP instruction in 1991 to 1995. Additional analysis indicated that very low birth weight and low birth weight newborns benefited the most from NRP program. The study concluded that although previous research had shown that the NRP instructions improved knowledge and skill among health care personnel in the delivery room, both short-term and long-term, there had been little evidence to demonstrate NRP impact on infant mortality.

In another study by Michael et al. (2011) entitled “A Neonatal Resuscitation Curriculum in Malawi, Africa: Did It Change In-Hospital Mortality?” the objective was to evaluate the training's impact on hospital staff and neonatal mortality rates. The pre/post curricular surveys of trainee attitude, knowledge, and skills were analyzed. An observational, longitudinal study of secondary data assessed neonatal mortality. The results of this study indicated that all trainees' (n=18) outcomes improved indicating a significant p-value. Additionally the results showed that Neonatal mortality did not change. There were 3449 births pre-intervention and 3515 post-intervention.

Neonatal mortality was 20.9 deaths per 1000 live births pre-intervention and 21.9/1000 post-intervention which also indicated a significant p-value. The study concluded that Short-term pre-/post-intervention evaluations frequently revealed positive results as in the case of Malawi. The results of the study show that frequent supervision and evaluation yielded positive results.

It will be, therefore, important to have the resuscitation teams at the hospital and health centres formed to have periodic supervision and monitoring of the technique in order to improve compliance.

A study entitled “Educational Impact of the Neonatal Resuscitation Program in Low-Risk Delivery Centers in a Developing Country” conducted by Carlo, Wright, Chomba et al. (2009) aimed at evaluating the effectiveness of the American Academy of Pediatrics Neonatal Resuscitation Program in improving knowledge, skills, and self-efficacy of nurse midwives in low-risk delivery clinics in developing countries. The content specifications of the National Resuscitation Program material applicable to college-educated nurse midwives working in low-risk clinics in Zambia was used to develop performance and self-efficacy evaluations focused on principles of resuscitation, initial steps, ventilation, and chest compressions. Qualified instructors administered the National Resuscitation Program course to 127 college-educated (4 years) nurse midwives who were employed in 18 primary-level delivery clinics in Lusaka and Ndola, Zambia in 2005.

The midwives had been in practice for 16 ± 9 years (range, 3–30 years; median, 14 years). The midwives were trained previously in neonatal resuscitation, but had not been trained with the National Resuscitation Program course. The midwives were encouraged to read the National Resuscitation Program textbook before the training. The course was conducted in English, with group meetings held at a high-delivery service referral hospital (University Teaching Hospital, Zambia) in 2 phases with the trainer-of-trainers model.

The study revealed that after training, knowledge improved significantly from 57% ± 14% to 80% ± 12%; skills improved the most from 43% ± 21% to 88% ± 9%; self-efficacy scores improved from 74% ± 14% to 90% ± 10%). The study further showed that written and performance scores decreased significantly 6 months after training. The study concluded that, the National Resuscitation Program training improved educational outcomes in college-educated practicing nurse midwives. Pre-training knowledge and skills scores were relatively low despite the advanced formal education and experience of the participants. National Resuscitation Program training had the potential to substantially improve knowledge and skills of neonatal resuscitation.

This implies that periodic neonatal resuscitation training program will help to improve the knowledge and the techniques of resuscitating neonates among the medical doctors and the midwives. If the medical doctors and midwives will be trained in neonatal resuscitation every six months, deterioration of knowledge and skills will be improved significantly.

Jabir, Doglioni, et al. (2009) in a study entitled “Knowledge and practical performance gained by Iraqi residents after participation to a neonatal resuscitation program course”, evaluated knowledge and performance of the health care professionals on clinical simulations following their participation in the National Resuscitation Program course. In this study, a 71- item derived from the standard test contained in the American Heart Association and American Academy of Paediatrics Neonatal Resuscitation Manual was administered to participants before and after the course. All participants were tested with a final Mega code (Mega code a scenario– National Resuscitation Program textbook) to evaluate their performance on clinical simulations.

The results of this study were that, twenty-six obstetrical and 2 paediatric residents participated in the National Resuscitation Program (NRP) course, respectively. The percentages of correct answers significantly improved from before (52 ± 14%) to immediately after the course (85 ± 7%); $p < 0.001$. Mean score obtained at the final Mega code was 68 ± 8%. Four out of 28 (14%) participants reached the minimum score required for passing the exam (80%). The study concluded that residents coming from a developing country (Iraq) significantly improved their knowledge attainment following participation in the NRP course; however, their performance on clinical simulations was unsatisfactory, suggesting that this aspect needed to be improved. Although the traditional methods of skills transfer (demonstrations) are still popular in our Zambian settings, Clinical simulation is receiving greater attention as a method of enhancing the clinical skills in the simulation laboratory before the actual practice on the patient. It is likely, therefore, that a combination of various methods of teaching be employed during training to have an impact on compliance with WHO neonatal resuscitation guidelines.

In order to determine whether the introduction of Obstetrics Emergency Training in line with the recommendations of the Clinical Negligence Scheme for Trusts (CNST) was associated with a reduction in perinatal asphyxia and neonatal Hypoxic Ischaemic Encephalopathy (HIE), Draycott et al. (2006) conducted a study entitled Does training in obstetric emergencies improve neonatal outcome in the United Kingdom? A retrospective cohort observational study was conducted in a tertiary referral maternity unit in a teaching hospital. In this study the term, cephalic presenting, singleton infants born at South mead Hospital between 1998 and 2003 were identified.

The Five-minute Apgar scores were reviewed. Infants that developed HIE were prospectively identified throughout this period. The study compared the period 'pre-training' (1998-1999), with the period 'post-training' (2001-2003). The main outcome measured five-minute Apgar scores and Hypoxic Ischaemic Encephalopathy. The results of the study indicated that 19,460 Infants were included. Infants born with 5-minute Apgar scores of < or=6 decreased from 86.6 to 44.6 per 10,000 births indicating a significant p-value and those with HIE decreased significantly from 27.3 to 13.6 per 10,000 births following the introduction of the training courses in 2000. Antepartum and intrapartum stillbirth at term rates remained unchanged, at about 15 and 4 per 10,000 births, respectively.

The study concluded that the introduction of obstetric emergencies training courses was associated with a significant reduction in low 5-minute Apgar scores and Hypoxic Ischaemic Encephalopathy. This improvement had been sustained as the trainings continued. This was the first time an educational intervention had been seen to be associated with a clinically important, and sustained, improvement in perinatal outcome. Zambia has four main tertiary hospitals which are the main referral hospitals in the country. It would be good to use the retrospective cohort observational study design to determine the effectiveness of neonatal resuscitation in tertiary hospitals in Zambia. If using this methodology will help yield the similar results then the methodology will be considered to very appropriate.

Sawyer, Sierocka-Castaneda et al. (2011) states that staff trained in neonatal resuscitation must apprentice with experienced personnel for some time before they can be independently responsible for an infant at a delivery. Furthermore, Simulation was likely to become an increasingly important component of training in neonatal resuscitation. It was therefore important that these refresher courses or in house training be conducted in our institution in order to pass on the skills to the newly qualified staff in our working environment. There is limited learning that takes place in the clinical area by observing others because there are no role models from which to observe and learn such important skills and techniques. It was recognized that knowledge and skill retention declines within weeks after initial resuscitation training. Refresher training is invariably required to maintain knowledge and skills; however, the optimal frequency for refresher training is unclear (Moser, Dracup and Doering, 1999). If the refresher courses coupled with mentorship program are strengthened among medical doctors and midwives then more learning will take place in the clinical area by observing the competent staff conduct neonatal resuscitation. The decline of the clinical skills within few weeks after training will be enhanced.

Riegel , Nafziger , McBurnie , et al. (2006) reported higher levels of retention from a program that achieved initial training to a high (mastery) level. However, deterioration of Cardiopulmonary Resuscitation (CPR) skills was still reported at 3 months. There is need, therefore, to have periodic skills training sessions in order to retain the highest levels of performance.

2.5 ATTITUDE TOWARDS NEONATAL RESUSCITATION

Melanie et al. (2008) conducted a study entitled Attitudes of Neonatologists toward Delivery Room Management of Confirmed Trisomy 18: Potential Factors Influencing a Changing Dynamic. The objective of this study was to determine the attitude of neonatal providers toward delivery room resuscitation of an infant with confirmed trisomy 18 with known congenital heart disease at ≥36 weeks of gestation.

The study revealed that Fifty-four (76%) of 71 surveys were completed. Of respondents, 44% indicated that they would be willing to initiate resuscitation. Maternal preference (70%) was the primary reason to initiate resuscitation, with the appearance of the neonate in the delivery room (46%) and legal concerns (25%) as additional factors.

The study concluded that there was universal consensus that trisomy 18 was a lethal anomaly for which resuscitation in the delivery room was not indicated. These data indicated that more providers (44%) than anticipated would consider initiation of resuscitation for an infant with trisomy 18 even with congenital heart disease. It was speculated that support for the best-interest standard for neonates was diminishing in favour of ceding without question to parental autonomy. If there were many studies conducted to determine the attitude of health profession towards neonatal resuscitation it would be easy to conclude that there is a positive relationship between attitude and compliance. As it is we would not be wrong to also conclude that there is no relationship between the two variables.

2.6 AVAILABILITY OF RESUSCITATION EQUIPMENT AND PROTOCOLS

According to Couper et al. (2005) and Pattinson et al. (2005), the South African Department of Health (DOH) policy ensures that appropriate neonatal resuscitators are available at every birth and used correctly. This was considered to be critically important in the management of birth asphyxia and in minimizing its associated sequelae. Furthermore, the lack of adequate neonatal resuscitation equipment and poor neonatal resuscitation skills amongst health care providers had been identified as contributing factors in these often avoidable neonatal deaths. All health care facilities conducting deliveries should be equipped and be able to provide basic to advanced neonatal resuscitation services in order to prevent deaths from birth asphyxia.

The delivery room should be equipped with all the tools necessary for successful resuscitation of a newborn of any size or gestational age. Wall et al. (2009) stated that the equipment should include radiant warmer, warmed blankets, a source of oxygen, instruments for visualizing and establishing an airway, a source of regulated suction, instruments and supplies for establishing intravenous (IV) access, trays equipped for emergency procedures, and drugs that may be useful in resuscitation. When followed South Africa Department of Health (DOH) policy ensured that the appropriate neonatal resuscitators were available at every birth and used correctly. This implies that all hospitals and health centres should be adequately equipped with all equipment required for successful neonatal resuscitation. Lack or inadequate neonatal resuscitation equipment will lead to a lot of short cuts and improvising. This will result in a lot of deviations from the WHO neonatal resuscitation guidelines and hence compliance will be compromised**.**

2.7 Conclusion

From the literature reviewed, it has been realised that training of medical doctors and midwives retained their knowledge and skill to a larger extent. Of the two, the knowledge was the one that was mostly affected. It also revealed that health professionals decided to stop resuscitation without the approval of the parents. It has also revealed that at every delivery they should be personnel with neonatal resuscitation skills to specifically attend to the neonate. Despite the qualification, assessing compliance with the WHO neonatal resuscitation standards had limitations in accomplishing the approved steps of the guidelines. Inadequacies twig from the medical doctors and midwives, the standard of operations for neonatal resuscitation, the equipment and the attitudes of the health professional. There was need to acknowledge the fact that there was limited literature regarding compliance with the WHO neonatal resuscitation and its associated factors from the Zambian perspective. Very little data had been documented hence the need to have conducted this research in order to determine compliance with WHO neonatal resuscitation guidelines. Conducting this study would help the policy makers to expedite the nest ways to enhance compliance in all the delivery centres.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

The study determined the level of compliance of the medical doctors and midwives with the WHO neonatal resuscitation guidelines in Kitwe District Health facilities.

3.2 RESEARCH DESIGN

An observational descriptive cross sectional study design was used to describe neonatal resuscitation as practised by medical doctors and midwives. This was a non-experimental research designs that did not involve manipulation of the situation, circumstances or experience of the participants. A descriptive design was chosen order to describe the levels to which the medical doctors and midwives complied with the WHO neonatal resuscitation guidelines. In addition, the design was chosen to provide the first hand information in Kitwe District Health facilities on neonatal resuscitation since the inception of Helping Babies Breathe and Emergency Obstetric and Newborn Care in 2006. The set back with this design is that it is only helpful in formulation of hypothesis but it cannot be used to test the hypothesis. This study was observational because the respondents conducted neonatal resuscitation without otherwise intervening. It was cross sectional because it was conducted at one point in time.

3.3 RESEARCH SETTING

This study was conducted in Kitwe District in the Copper Belt Province in five health facilities offering maternity services. The sites included labour wards at Kitwe Central Hospital, Chimwemwe, Buchi, Luangwa and Ndeke urban health centres with 24 hours delivery services. These centres were selected because they were providing maternity services and neonatal resuscitation was being provided in these same centres. Secondly, these centres were within reach for the investigator.

3.4 STUDY POPULATION

The study population constituted Medical doctors and Midwives who met the criterion for the study.

3.4.1 **Target population**

The target population comprised medical doctors and midwives from the Labour wards at Kitwe central hospital and the four urban delivery centres under Kitwe District Health Office.

3.4.2 **Accessible population**

The accessible population for this study was medical doctors and midwives working in Kitwe district delivery centres. There are 15 medical doctors and 95 midwives. The total accessible population was 110.

3.5 SAMPLE SELECTION

Purposive sampling was used to select the health facilities that are providing 24 hours maternity services. Four (4) maternity health centres (Chimwemwe, Buchi, Ndeke and Luangwa) and two (2) labour wards (Luena, SBCU and Lukulu) at Kitwe Central Hospital. Convenient sampling method was used to select the respondents. This method involves the use of available respondents at the site. This method of sampling respondents was chosen because the population was limited. However, the researcher was mindful of the fact that the method had the demerit of having an unrepresentative sample. The medical doctors and the midwives who met the criteria were included in the study. The researcher included the respondents that gave consent to participate in the study.

3.6. INCLUSION CRITERIA/ELIGIBILITY CRITERIA

All practicing medical doctors, registered, enrolled and certified midwives who were trained within Zambia with the duration of practice ≥ six (6) months. These would have been subjected to almost the same content and standard of practice. Assessing the medical doctors and midwives trained outside the country would have biased the results because they could have been some major differences in conducting the procedure on the actual neonates.

3.7 EXCLUSION CRITERIA

All medical doctors and midwives not practicing in labour ward; trained outside the country; that had served < six months; those on vacation leave; off sick.

3.8 SAMPLE SIZE

The sample size was calculated using the formula of a finite population as indicated below:

$s = \frac{x^2\ NP\ (1-P)}{d^2\ (N-1) + x^2 P\ (1-P)}$ Where;

$S = \frac{1.96^2 * 110 * 0.5\ (1-0.5)}{0.05^2\ (110-1) + 1.96^2 * 0.5\ (1-0.5)}$

$S = \underline{86}$

Where;

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level of 0.05 ($1.96^2 = 3.84$).

N = the population size.

P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (0.05).

Choosing

X = 1.96

N = 110

P = 0.50

d = 0.05

s = 86 (as calculated in the above formula)

The sample size was calculated based on the 110 medical doctors and midwives that were working in the 24 hours maternity clinics and the wards at Kitwe central hospital. Based on Krejcie and Morgan's (1979) formula for calculating sample size of a finite population, the calculated sample size of 86 participants was arrived at. However, a higher number was targeted in order to account for possible exclusions and drop out.

3.9 DATA COLLECTION TOOL

A self-administered questionnaire (see appendix 3) was used to obtain both qualitative and quantitative data. Checklist (see appendix 6) was also used to observe the routine practices of medical doctors and midwives, assess the availability of resuscitation equipment and medical/surgical supplies. Data was collected over a period of 6 weeks.

3.9.1. Self-administered questionnaire

The questionnaire had both open and closed ended questions. All the respondents were interviewed using the same tool. The advantage of using a self-administered questionnaire was that the respondents were not being interviewed and therefore the interviewer did not influence their opinion. However, the researcher was aware of the demerits a self-administered questionnaire that some items would be misunderstood by the respondent leading to submission of wrong information and missing data. The questionnaires were checked for completeness of data. This was minimised by pre testing the tool before the actual study was conducted.

3.9.2 A checklist

A checklist permitted the collection of accurate information on behaviours of individuals that could not be obtained through a questionnaire. Medical doctors and midwives' behaviour was observed (with regards to neonatal resuscitation), recorded and analysed. The observation checklist had three parts (see appendix 6), section A that elicited the information on assessment and had ten (10) steps to be observed. It gave information on how medical doctors and midwives complied with the WHO guidelines on the assessment before and during the initial steps for resuscitation. Section B elicited information on initiation of breathing.

It section had twenty (20) steps that were observed during the procedure. The section gave information on how medical doctors and midwives initiated the breathing in accordance with the neonatal resuscitation guidelines. Section C elicited information on administration of oxygen to the neonatal during resuscitation. This section had seven steps to follow of which the last three (3) steps brought information on infection prevention practices and the courtesy to the mother. Training session for research assistant that helped in observation of the actual procedure was conducted. However, the researcher was mindful of the demerits of the tool which are observer bias and failure to behave normally when under observation. This was minimised by careful training of the assistant during the pre test and through the use of participant observation. The research assistants were allowed to work with the respondents for easy adaptation. This helped to reduce the Hawthorne effect.

3.10 VALIDITY

To ensure validity of the data collection instrument, the researcher conducted an extensive literature search on the study variables before the research instrument were developed so as to capture full content domain. The instrument consisted of questions on each of the variables to be measured so that the relevant issues concerning compliance with neonatal resuscitation would be captured. The data collection tools were both checked by the experts in HBB and EmONC within the hospital. Pre testing of the instruments was done to determine whether the respondents brought out the desired information. The respondents of the pre test were not part of the study sample. Adjustments were made following the pre-test on the content and sequence of the questions.

3.11 RELIABILITY

Reliability is the degree of consistency or accuracy with which an instrument measures the attribute it is designed to measure (Polit and Hungler, 2001). The instrument used should be able to bring out accurate information whereby when the same instrument is used after some time it should have the same response. Reliability of the self-administered was measured by pre testing it. The respondents were asked if they were any questions they did not understand in the questionnaire and why they answered the questions in the manner they did.

The investigator was helped to identify the weaknesses, shortcomings and the strengths of the tools. The observation checklist was also pre-tested to measure reliability. However there were no changes that were made on the observation checklist. Instructions on self-administered questionnaire were adhered to eliminate biases by administering the same instrument across the subjects. This also minimized errors. The questionnaire was adapted from Essential Newborn Care training guide by World Health Organisation.

3.12 DATA COLLECTION TECHNIQUE

Data collection technique is gathering information needed to address a research problem (Polit and Hungler, 2001). The data collection techniques used in this study was the non-interventional observations involved which examination and recording the respondents step by step conducting neonatal resuscitation procedure. The administration of the self-administered questionnaire allowed the respondents to give answers to questions that were asked.

3.12.1 Structured Observation

Structured observation technique was used. This was an observation method that allowed the observer to watch the respondents resuscitate the neonates. Each observation took about 30 minutes. Observations of neonatal resuscitation guidelines were done as and when there was a neonate to be resuscitated. Researcher assistants observed the practice of medical doctors and midwives while working with them and achieving the goal of observing the extent to which the WHO neonatal resuscitation guidelines were adhered to. Twenty (20) midwives were observed performing the resuscitation procedure using established guidelines (Checklist Appendix 5). The observations took place in the delivery room at the hospital and health centres and in the neonatal care unit by the investigator and the research assistants.

3.12.2 Questionnaire distribution

Questionnaires were administered to all the doctors and midwives after reading and understanding the instructions. Questionnaires were distributed to the respondents who were given adequate time to complete the questionnaires and thereafter the researcher collected them. The questionnaires were checked for completeness before they were collected for analysis.

3.13 PRE-TEST

The pre-test was conducted in Ndola district health facilities. The pre-test was essential to test the effectiveness of the data collection tools. It helped to ensure that the questions were clear and concise as well as helped to refine the instruments in order to enhance validity and reliability. Some questions were rephrased to make them clear. In question 9, the word 'ambu bag' was rephrased to read bag and mask, question 26 the sentence 'since you started work in this institution' was deleted and rephrased to start with 'Have you received any in house training, question 32 the word 'resuscitation' was changed to read 'resuscitaire'. Question 44 was deleted as the factors were to be determined from the study. Question 45 was rephrased to read 'suggestion to improve compliance with neonatal resuscitation. The semi structured questionnaire was administered to 10 midwives and doctors. The observations were done on 5 midwives resuscitating a neonate. The respondents were selected using the convenient sampling method.

3.14 ETHICAL AND ADMINISTRATIVE CONSIDERATION

Ethical clearance was sought from the University of Zambia Biomedical Research Ethics committee. Permission to conduct the research was obtained from the Copperbelt Provincial Medical Officer, Kitwe Central Hospital Senior Medical Superintendent and the District Medical Officer for Kitwe. Serial numbers were used to identify the respondents. The purpose of the study was explained to all the respondents before their involvement in the study so that they understood the nature of the study to which they were consenting as well as enabled them to participate in the study willingly. The questionnaires were kept in the big envelope and locked up for safety.

For the observations, permission was obtained from individual health professionals. With regards to anonymity, no respondents' names were written on the self administered questionnaire.

3.15 DATA PROCESSING AND ANALYSIS

Following data collection, the pre-coded interview schedule was double checked for completeness, consistency, legibility and accuracy daily. Numerical codes were used on the interview schedule. The self-administered questionnaire was checked for completeness of data and arranged according to specific sites of study. The data was edited to gain internal consistence, legibility and accuracy on daily basis. The closed ended questions were assigned numerical codes. The data collected was entered and stored into the data editor of IBM® SPSS® and statistically analyzed using IBM SPSS Statistics for Windows Version 20.0 (IBM Corp. Armonk, NY, and USA). This computer software statistical package enabled the researcher to obtain a data set on compliance with neonatal resuscitation and demographic, knowledge, attitude, availability of resuscitation equipment and protocols and factors associated with compliance with the WHO neonatal resuscitation guidelines by the medical doctors and midwives.

Data from the open ended questions was coded using numerical codes. Responses were summarized into groups, reducing the number of different responses to make comparisons easier. Data was sorted into concepts into groups, so that in each group the concepts were both as similar as possible to each other, and as different as possible from concepts in every other group. Data obtained from the checklist was quantified. Thereafter, entered and analysed with the use of SPSS Statistics for Windows Version 20.0 then be presented in frequency.

The confidence interval was set at 95%. This meant that if the experiment was repeated several times and the confidence limits calculated from each sample, 95% of the time they included the true mean. This was a range in which the value of population parameter was estimated to be. A 5% level of significance was set, only p-value of 0.05 or less was considered statistically significant. The chi-square was used to test the associations between dependant variable, compliance and independent variables, knowledge, attitude, institutional resource. The factors associated with compliance were analysed using multivariate binary logistical regression.

CHAPTER FOUR

4.0 PRESENTATION OF FINDINGS

4.1 INTRODUCTION

A total of 86 respondents participated in the study. The findings of the study have been presented using frequency tables, bar charts, pie chart and in cross tabulations. Cross tabulations of the dependent (compliance with neonatal resuscitation guideline) and independent variables (knowledge, attitude, training and availability of the neonatal resuscitation equipment) were done to show the relationship among the variables so that meaningful inferences could be drawn. The order of the presentation of findings is as follows; demographic characteristics, knowledge on neonatal resuscitation, attitude towards neonatal resuscitation, in house refresher courses on neonatal resuscitation, availability of neonatal resuscitation and compliance with the WHO neonatal resuscitation guidelines.

4.2 SECTION A: DEMOGRAPHIC CHARACTERISTICS

The demographic characteristics of the respondents include sex, age, health profession, years of experience and health facility (Table 2).

Table 2: Demographic characteristics of the respondents (n = 86)

Variables	Frequency	Percent
Sex		
Male	13	15.1
Female	73	84.9
Total	**86**	**100.0**
Marital status		
Married	47	54.7
Single	16	18.6
Widowed	15	17.4
Divorced	8	9.3
Separated	0	0.0
Total	**86**	**100.0**
Age in years		
20-30 yrs	12	14.0
31-40 yrs	30	34.9
41-50 yrs	27	31.4
51-60 yrs	15	17.4
61 and above	2	2.3
Total	**86**	**100.0**
Health profession		
Registered midwife	34	39.5
Enrolled midwife	39	45.3
Certified midwife	8	9.3
Obstetrician	2	2.3
medical doctor	3	3.5
Total	**86**	**100.0**
Years of experience		
0-5 years	27	31.4
6-10 years	14	16.3
11-15 years	16	18.6
16-20 years	15	17.4
above 20 years	14	16.3
Total	**86**	**100.0**
Health facility		
hospital labour ward	38	44.2
health centre labour ward	30	34.9
special baby care unit	18	20.9%
Total	**86**	**100.0**

Table 2 shows that 15.1% of the respondents were males while 84.9% of the respondents were female.

Most of the respondents (55.8%) were married while 9.3% of the respondents were divorced. Majority of the respondents (34.9%) were in the age group of 31 to 40 years, while 2.3% were 61 years of age and above.

Majority of the respondents (45.3%) were Enrolled Midwives while 2.3 % were obstetricians. Most of the respondents (31.4%) had years of experience between 0 - 5 years while 16.3% were between 6 - 10 years and over 20 years of experience.

Majority of the respondents (44.2%) were operating from hospital labour wards while 20.9% from special baby care unit at the hospital.

4.3 SECTION B: KNOWLEDGE OF NEONATAL RESUSCITATION

This section elicited the information on the knowledge the medical doctors and midwives had on neonatal resuscitation.

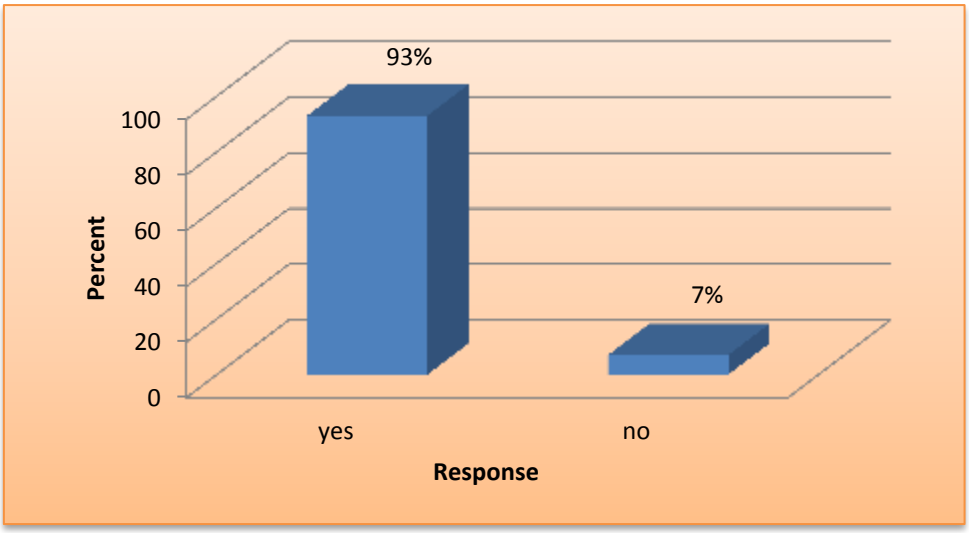


Figure 3: Respondents' response on whether they have ever heard of neonatal resuscitation (n = 86)

According to figure 3, majority of the respondents (93%) had heard of neonatal resuscitation while 7% of the respondents had never heard (Figure 3).

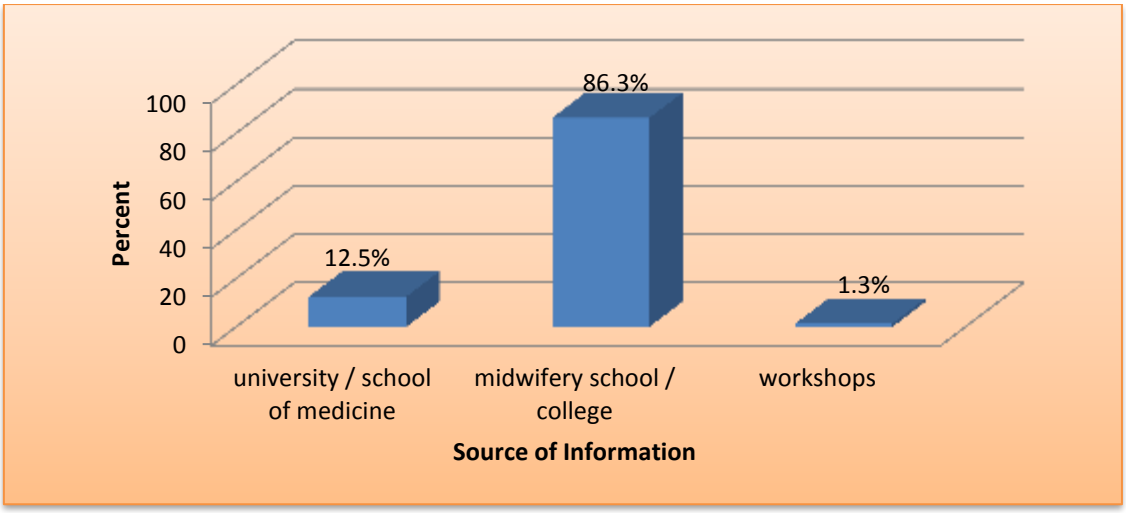


Figure 4: Respondents' Responses on where they have heard of neonatal resuscitation (n = 86)

Figure 4 above shows that most of the respondents (86.3%) had heard of neonatal resuscitation from the midwifery schools/college while 1.3% of the respondents heard of neonatal resuscitation from workshops.

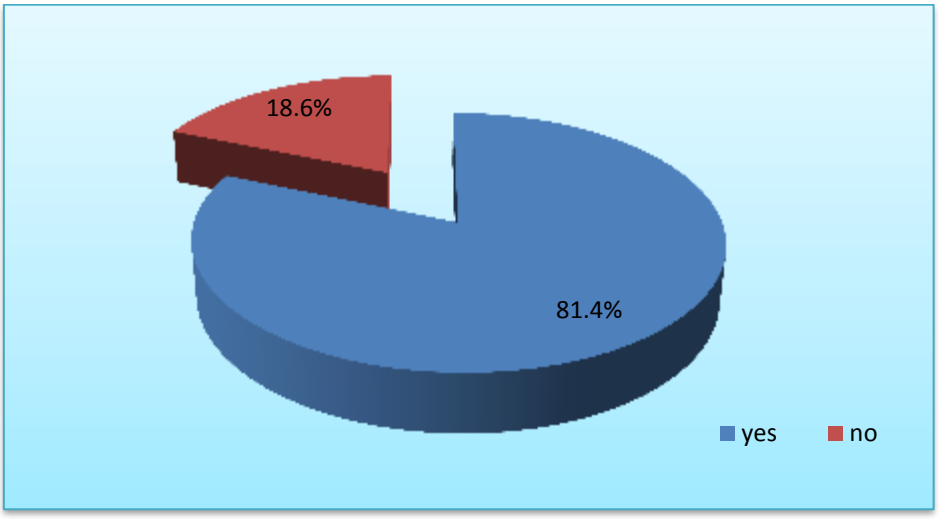


Figure 5: Respondents' response on whether it is necessary to test endotracheal tube and ambu bag before use (n = 86)

Figure 5 shows that majority (81.4%) of the respondents mentioned that it was necessary to test the endotracheal tube and ambu bag before use, while 18.6% of the respondent mentioned that was not necessary.

Table 3: Respondents' reasons for testing the endotracheal tube and ambu bag before use (n = 86)

Reasons for testing the endotracheal tube and ambu bag	Frequency	Percent
To ensure that there are in good working condition	58	82.9
To prevent panicking and wasting time	12	17.1
Total	**70**	**100.0**

According to table 3 majority of the respondents (82.9%) reported that testing the endotracheal tube and ambu bag was done to ensure that they were in good working condition, while 17.1% of the respondents reported that it was to prevent panicking and wastage of time.

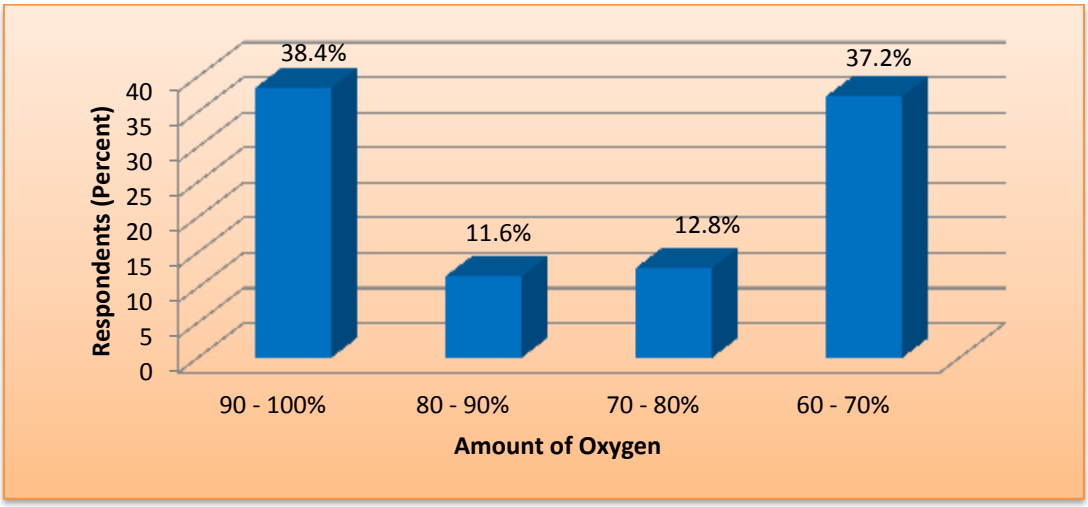


Figure 6: Respondents' response on how much oxygen saturation should be given to the neonate at one minute Apgar score during resuscitation (n = 86)

Figures 6 shows that majority of the respondents (38.4%) mentioned that 90 – 100% oxygen should be given to a neonate at one minute Apgar score while 11.6% of the respondents indicated 80 – 90% oxygen saturation.

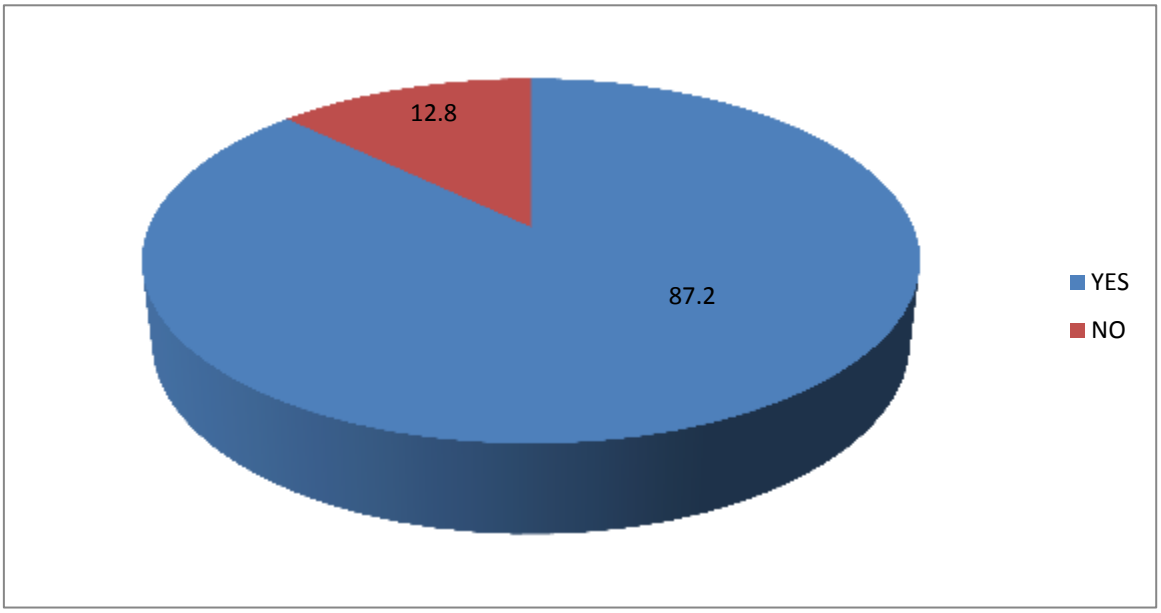


Figure 7: Respondents' responses on whether there is a relationship between the neonatal resuscitation and the Apgar score (n = 86)

According to Figure 7 above, majority of the respondents (87.2%) mentioned that there was a relationship between Apgar score and neonatal resuscitation while 12.8% of the respondents reported that there was no relationship.

Table 4: Responses of the respondents on the relationship between neonatal resuscitation and Apgar score (n = 75)

Connection between neonatal resuscitation and Apgar score	**Frequency**	**Percent**
It's useful in identifying neonates that require resuscitation at birth	61	81.3
Helps to know how much the neonate will require to be resuscitated	9	12.0
No response	5	6.7
Total	**75**	**100.0**

Table 4 shows that most of the respondents (81.3%) mentioned that the Apgar score is useful in identifying neonates that require resuscitation at birth while 6.7% of the respondents did not mention anything.

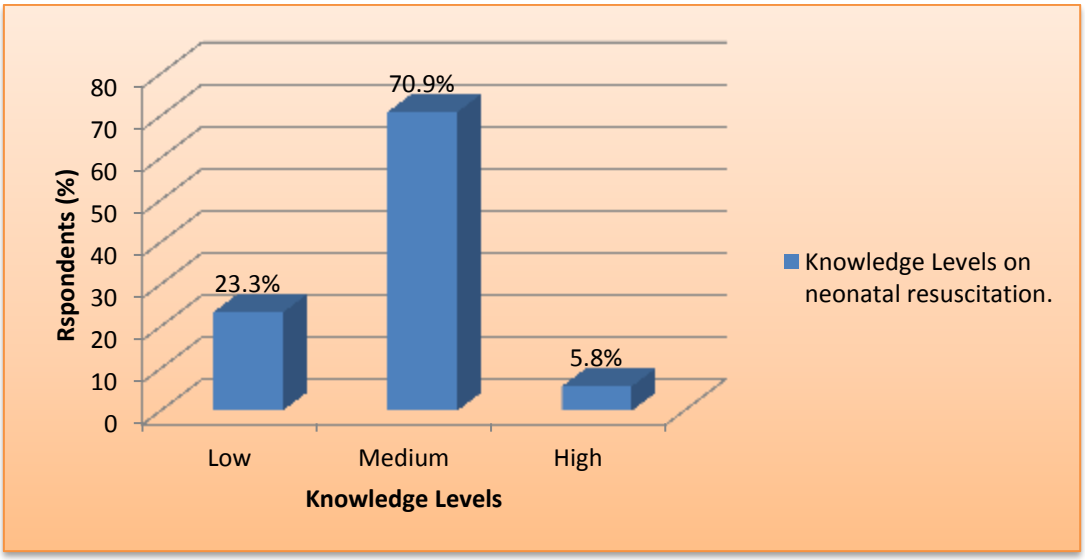


Figure 8: Distribution knowledge on neonatal resuscitation (n = 86)

Figure 8 shows that most of the respondents (70.9%) had medium knowledge while 5.8% of the respondents had high knowledge.

4.4 SECTION C: ATTITUDE TOWARDS NEONATAL RESUSCITATION

This section elicited information on the attitude of medical doctors and midwives towards neonatal resuscitation.

Table 5: Attitude of medical doctors and midwives towards neonatal resuscitation

Attitude of medical doctors and midwives toward neonatal resuscitation	**Frequency**	**Percent**
neonatal resuscitation is beneficial to the neonate		
Strongly agree	17	19.8
Agree	69	80.2
Total	**86**	**100**
It is recommended to use the neonatal resuscitation guidelines when resuscitating every neonate		
Strongly agree	67	77.9
Agree	19	22.1
Total	**86**	**100**
medical doctors and midwives were adequately prepared to conduct neonatal resuscitation		
Strongly agree	35	40.7
Agree	45	52.3
Disagree	5	5.8
Strongly disagree	1	1.2
Total	**86**	**100**
Medical doctors and midwives felt that neonates with gross malformation should be resuscitated		
Strongly agree	24	27.9
Agree	42	48.8
Disagree	9	10.5
Strongly disagree	3	3.5
Uncertain	8	9.3
Total	**86**	**100**
use neonatal resuscitation guidelines every time they are resuscitating a neonate		
Strongly agree	49	57
Agree	35	40.7
Disagree	2	2.3
Total	**86**	**100**
Neonatal resuscitation should be left for midwives only		
Strongly agree	3	3.5
Agree	9	10.5
Disagree	42	48.8
Strongly disagree	30	34.9
Uncertain	2	2.3
Total	**86**	**100**

Table 5 shows that majority of the respondents (80.2%) agreed that neonatal resuscitation was beneficial to the neonate, 77.9% of the respondents strongly agreed that medical doctors and midwives were adequately prepared to conduct neonatal resuscitation when resuscitating every neonate.

Most of the respondents (52.3%) agree that medical doctors and midwives were adequately prepared to conduct neonatal resuscitation, 48.8% of the respondents strongly agreed to resuscitate the grossly malformed neonate (Table 5). On whether neonatal resuscitation should be left to medical doctors only 48.8% of the respondents disagreed to leave the procedure to midwives only.

Table 6: Neonatal resuscitation should be left to midwives only (n=30)

Respondents that strongly agree that neonatal resuscitation should be left to midwives only	**Frequency**	**Percent**
All the doctors and midwives have been trained to conduct neonatal resuscitation.	28	93.3
Gave no response	2	6.
Total	**30**	**100.0**

According to Table 6, out of 30 respondents that strongly disagreed, most of the respondents (93.3%) mentioned that all doctors and midwives have been trained to conduct neonatal resuscitation while 6.7% of the respondents gave no reason.

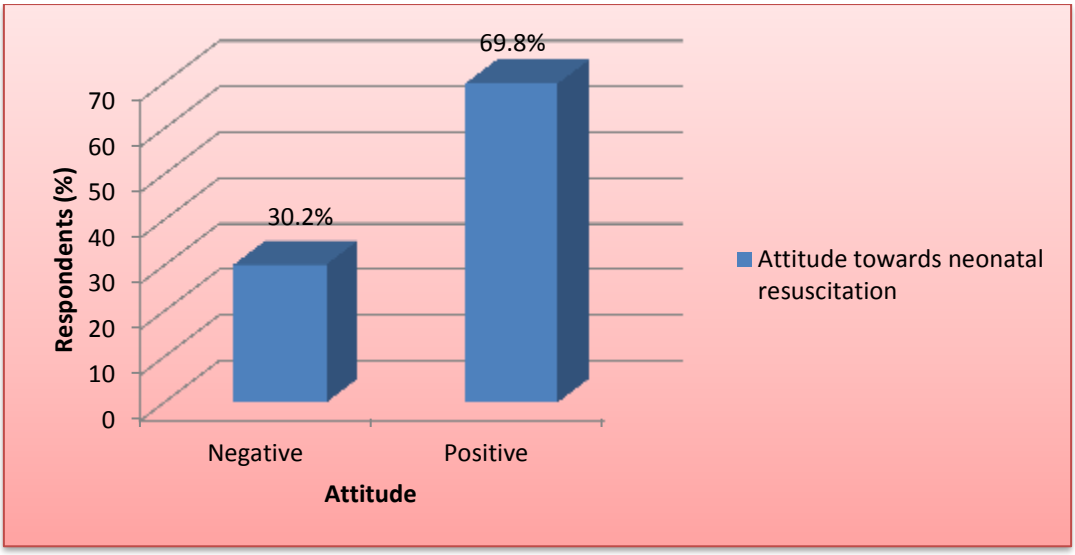


Figure 9: Distribution of attitude towards neonatal resuscitation (n = 86)

According to Figure 9, majority of the respondent (69.8%) had positive attitude while 30.2% of the respondents had negative attitude.

4.5 Section D: In House Refresher Courses on Neonatal Resuscitation

This section elicited information on in house trainings that the medical doctors and midwives had attended. Two or more in house trainings in a year were considered to be adequate while less than two in house training were considered to be inadequate training.

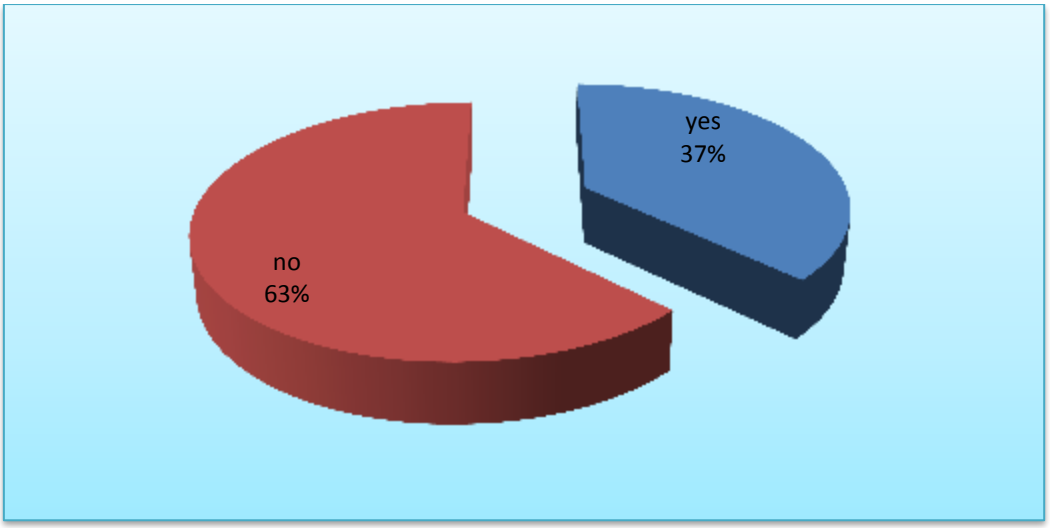


Figure 10: Respondents response on whether they have received any additional training on neonatal resuscitation (n = 86)

Figure 10 above revealed that majority of the respondents (63%) reported that they had not received any additional training on neonatal resuscitation while 37 % of the respondents reported that they had received additional training on neonatal resuscitation.

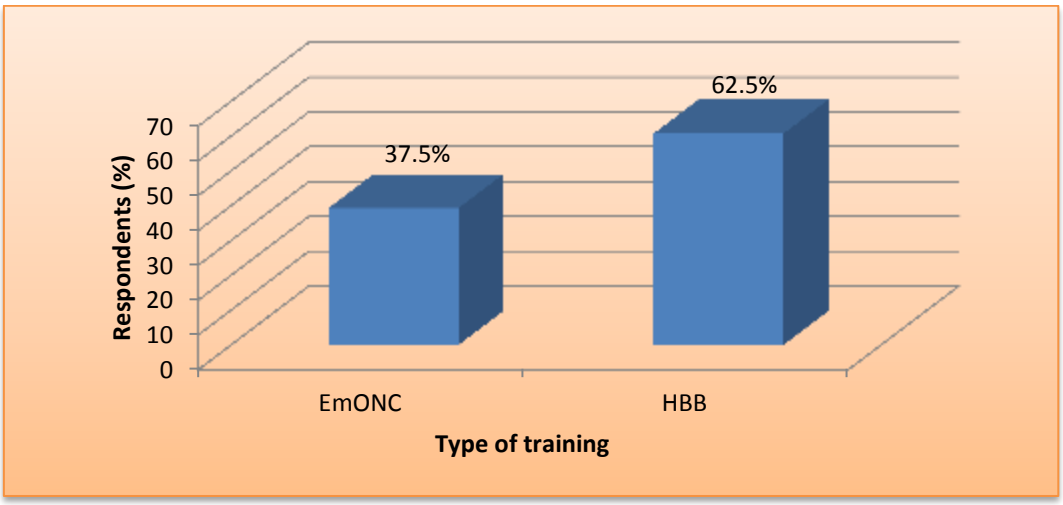


Figure 11: Respondents' response on the types of training they have attended (n = 32)

Figure 11 above show that majority of the respondents (62.5%) attended the HBB training while 37.5% of the respondents attended the EmONC training.

Table 7: Respondents' responses on the number of trainings they had attended (n = 32)

Number of training per year	Frequency	Percent
Three	8	25.0
Two	5	15.6
One	19	59.4
Total	**32**	**100.0**

Table 7 above shows that majority of the respondents (59.4%) indicated that they only had attended one (1) training in a year while 15.6% indicated that they had attended two (2) trainings on neonatal resuscitation in a year.

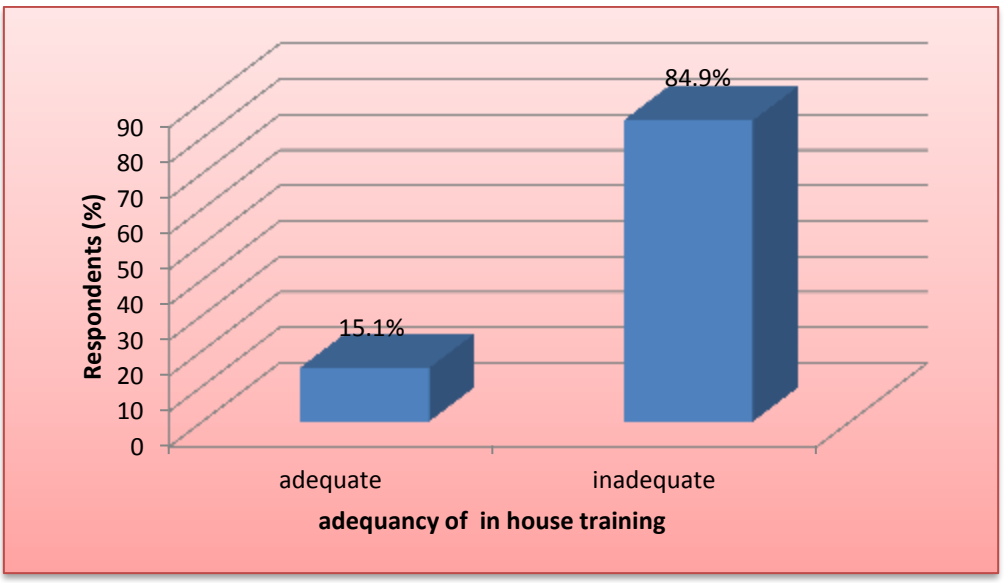


Figure 12: Distribution of training on neonatal resuscitation

Figure 12 shows that 15.1% of the respondents had received adequate in house training, while the majority of respondents (84.9%) had received inadequate in house training.

4.6 SECTION E: AVAILABILITY OF NEONATAL RESUSCITATION EQUIPMENT

The section elicited information on the availability of neonatal resuscitation equipment.

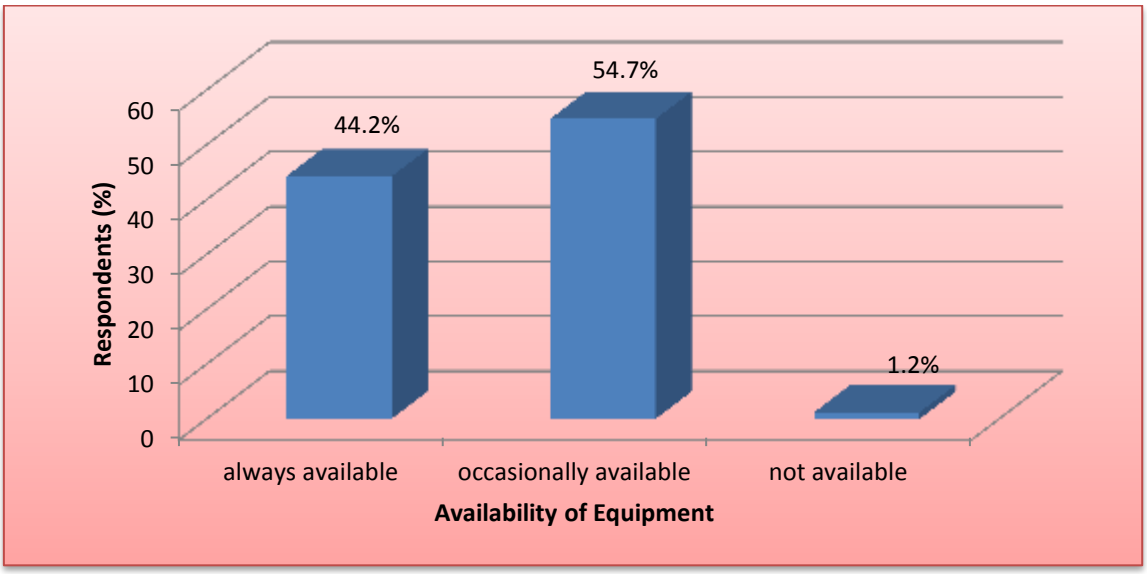


Figure 13: Respondents response on the availability of equipment for neonatal resuscitation (n = 86)

According to Figure 13, most of the respondents (54.7%) mentioned that the equipment for neonatal resuscitation was occasionally available while 1.2% of the respondents mentioned that the neonatal resuscitation equipment was not available.

Table 8: Neonatal resuscitation equipment influences the care given during resuscitation (n = 86)

Neonatal resuscitation equipment influences the care	Frequency	Percent
Strongly Agree	55	64.0
Agree	27	31.4
Disagree	4	4.7
Total	**86**	**100.0**

Table 8 above show that most of the respondents (64%) strongly agreed that neonatal resuscitation equipment influenced the care given to the neonatal during resuscitation while 4.7% of the respondents disagreed that equipment did not influenced the care during resuscitation.

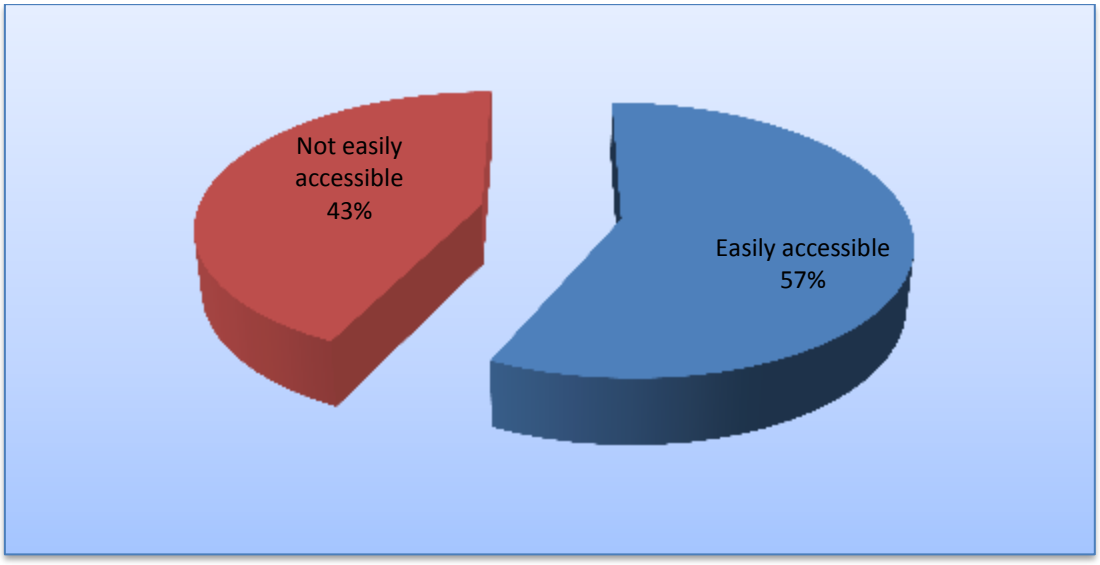


Figure 14: Respondents' response on how easy is it to access/ obtain resuscitation equipment in their department (n = 86)

According to Figure 14, majority of the respondents (57%) indicated that the equipment was easily accessible, while 43% of the respondents indicated that the equipment was not easily accessible.

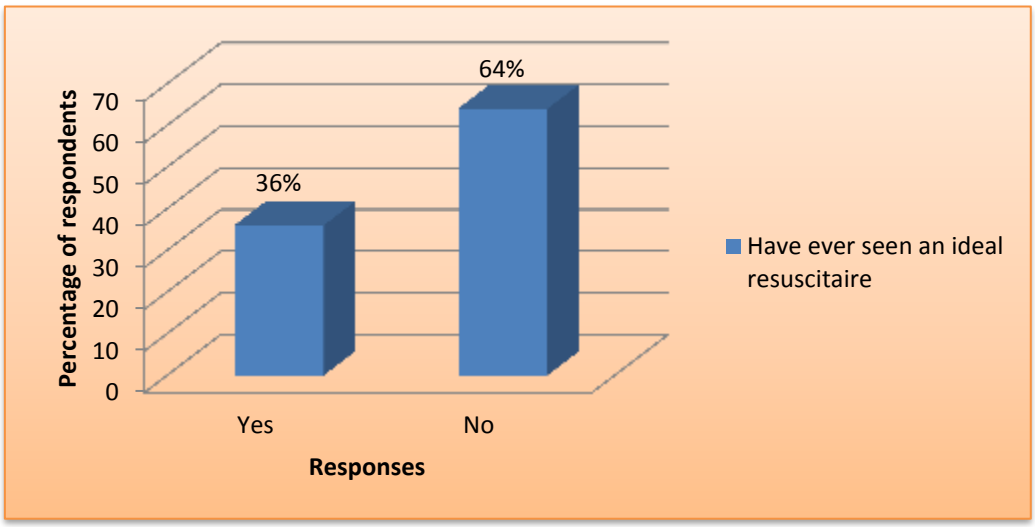


Figure 15: Respondents' response on whether they have ever seen an ideal resuscitaire in their labour ward (n = 86)

According to Figure 15 above, most of the respondents (64%) had never seen the ideal neonatal resuscitation equipment while 36% mentioned that they had seen ideal resuscitation equipment in their institutions.

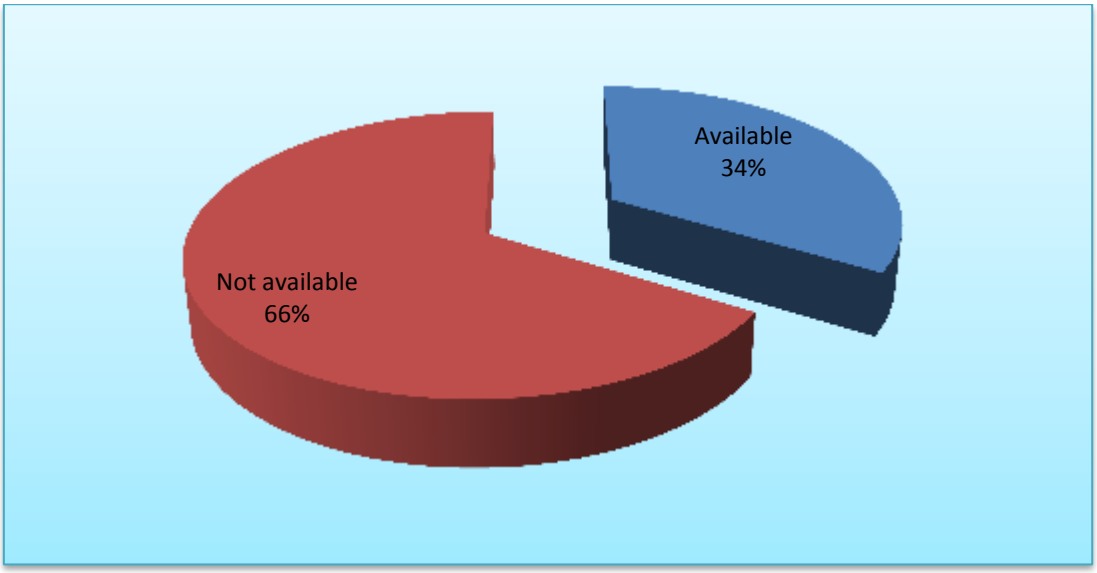


Figure 16: Distribution on availability of resuscitation equipment (n = 86)

According to figure 16, most of the neonatal resuscitation equipment (66%) was not available while 34% of the neonatal resuscitation equipment was available.

4.7 SECTION F: COMPLIANCE WITH NEONATAL RESUSCITATION

The section provided information on compliance with the WHO neonatal resuscitation guidelines by medical doctors and midwives.

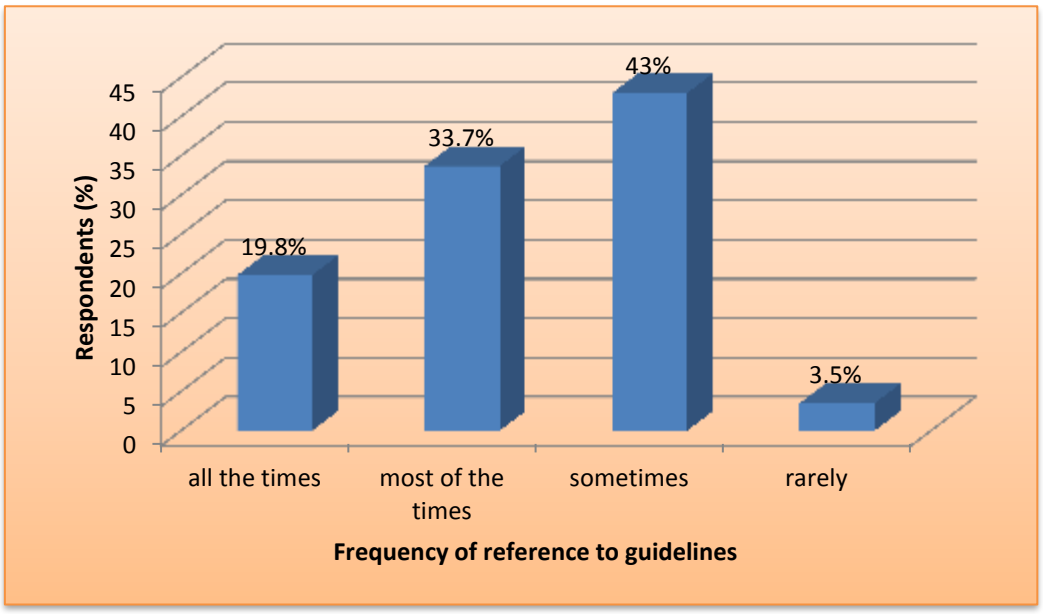


Figure 17: Respondents' responses on how often they refer to the neonatal resuscitation guideline during neonatal resuscitation (n = 86)

Figure 17 above reveals that most of the respondents (43%) mentioned that they sometimes referred to neonatal resuscitation guidelines while 3.5% of the respondents rarely referred to the guidelines.

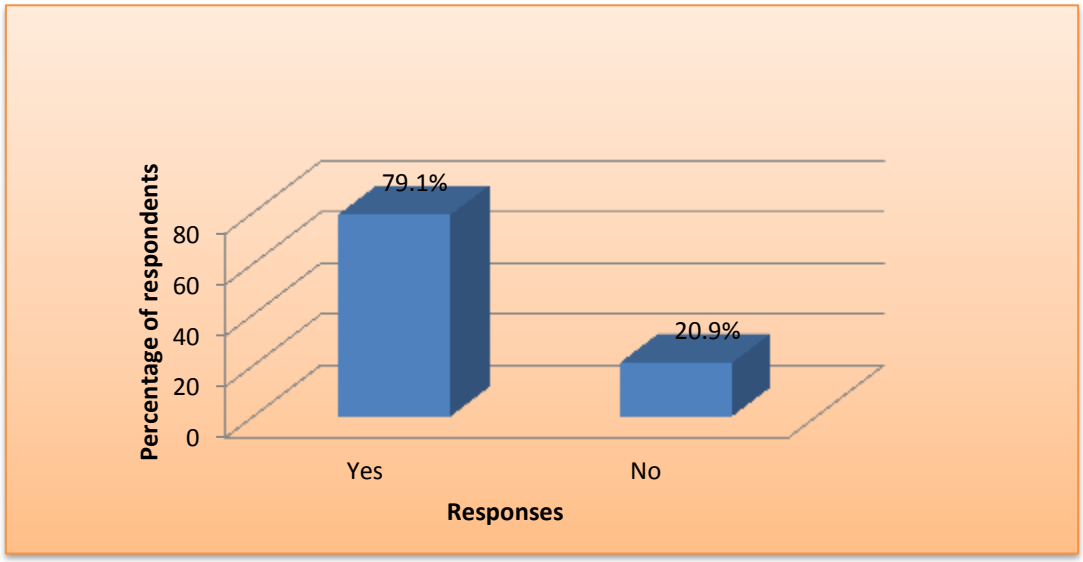


Figure 18: Respondents response on whether the medical doctors and midwives use a suction machine to resuscitate the neonate (n = 86)

Figure 18 above shows that, most of the respondents (79.1%) mentioned that they use suction machines to resuscitate the baby while 20.9% of the respondents mentioned that they do not use the suction machine to resuscitate the neonate.

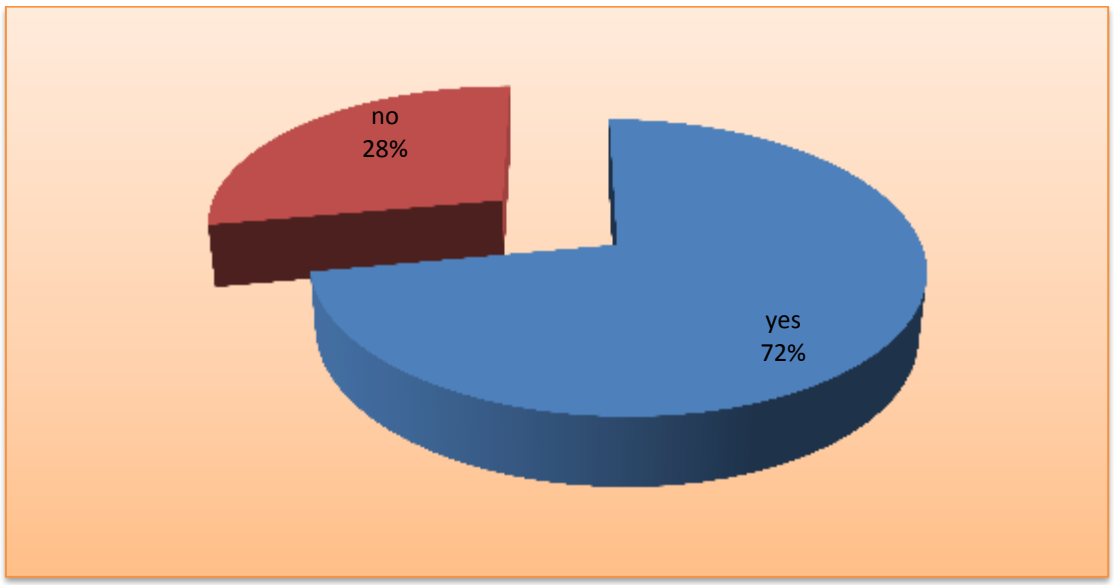


Figure 19: Respondents' response on whether staffing levels have a bearing on the use of resuscitation guidelines (n = 86)

Figure 19 shows that most of the respondents (72.1%) indicated that staffing levels had a bearing on the use of neonatal resuscitation guidelines while 27.9% of the respondents indicated that staffing levels did not have a bearing on neonatal resuscitation.

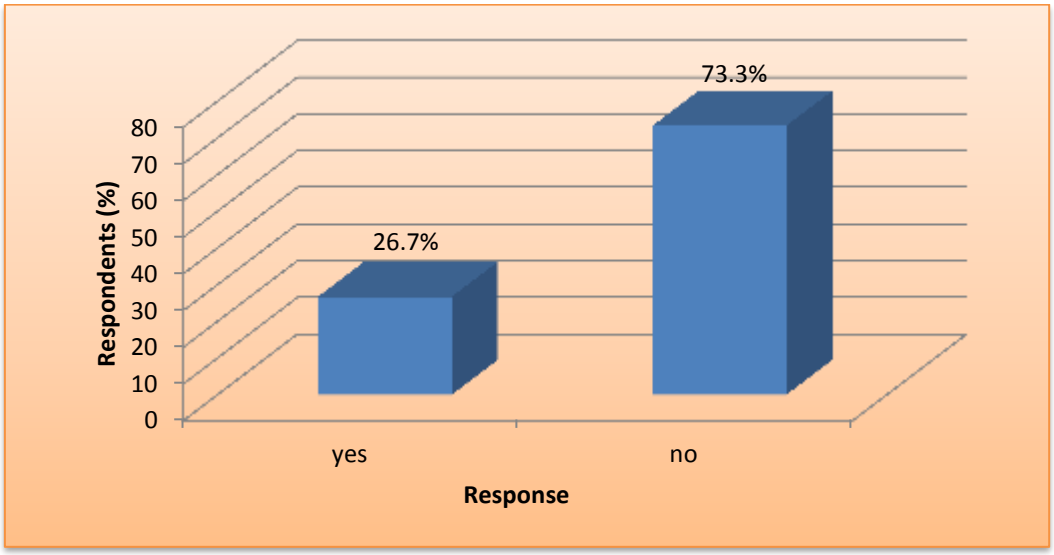


Figure 20 : Respondents' response on whether they had problems in using the guidelines for neonatal resuscitation (n = 86)

According to figure 20 above, most of the respondents (73.3%) mentioned that they did not have problems using the guidelines while 26.7% mentioned that they had no problems using the guidelines for neonatal resuscitation.

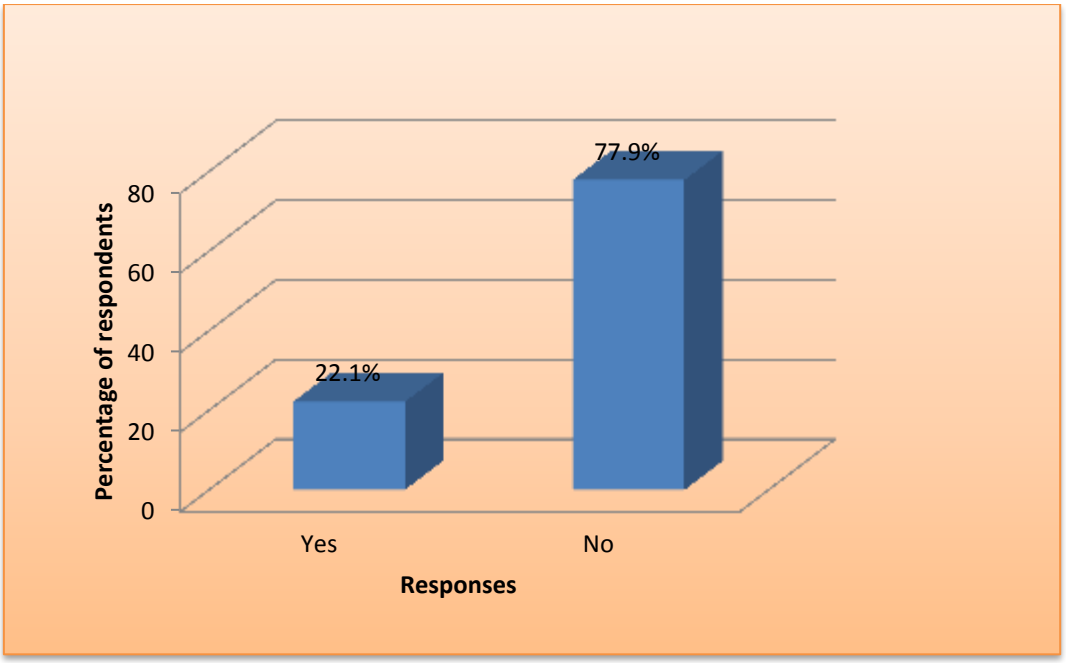


Figure 21: Respondents' responses on whether they had a team leader for neonatal resuscitation (n = 86)

Figure 21 above shows that majority of the respondent (77.9%) mentioned that they did not have a team leader while 22.1% of the respondents that they had a team leader for neonatal resuscitation.

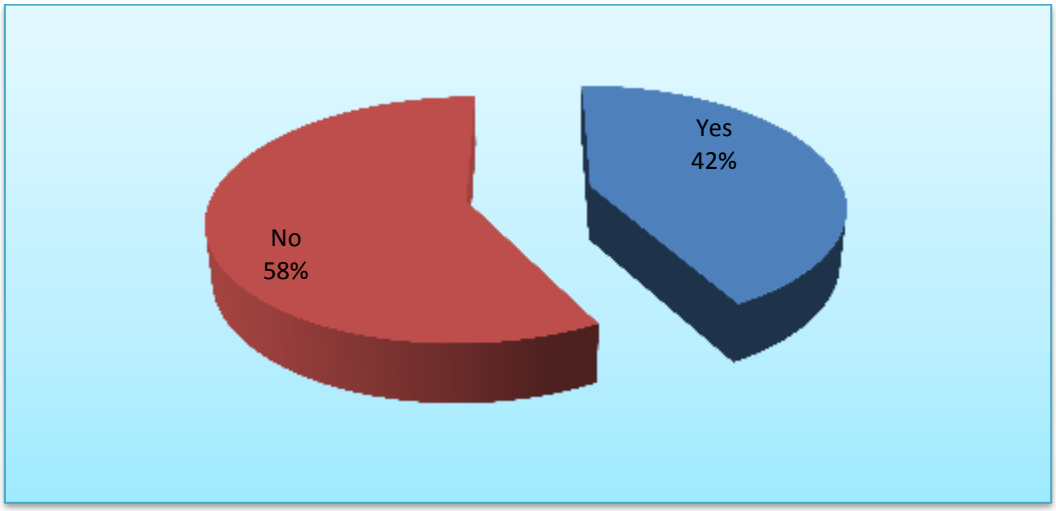


Figure 22: Respondents' response on whether the team leader was available when resuscitating every neonate in their facility (n= 19).

According to figure 22, most of the respondents (57.9%) mentioned that the team leader was not available while 42.1% of the respondents mentioned that the team leader was available when resuscitating a neonate in their facility.

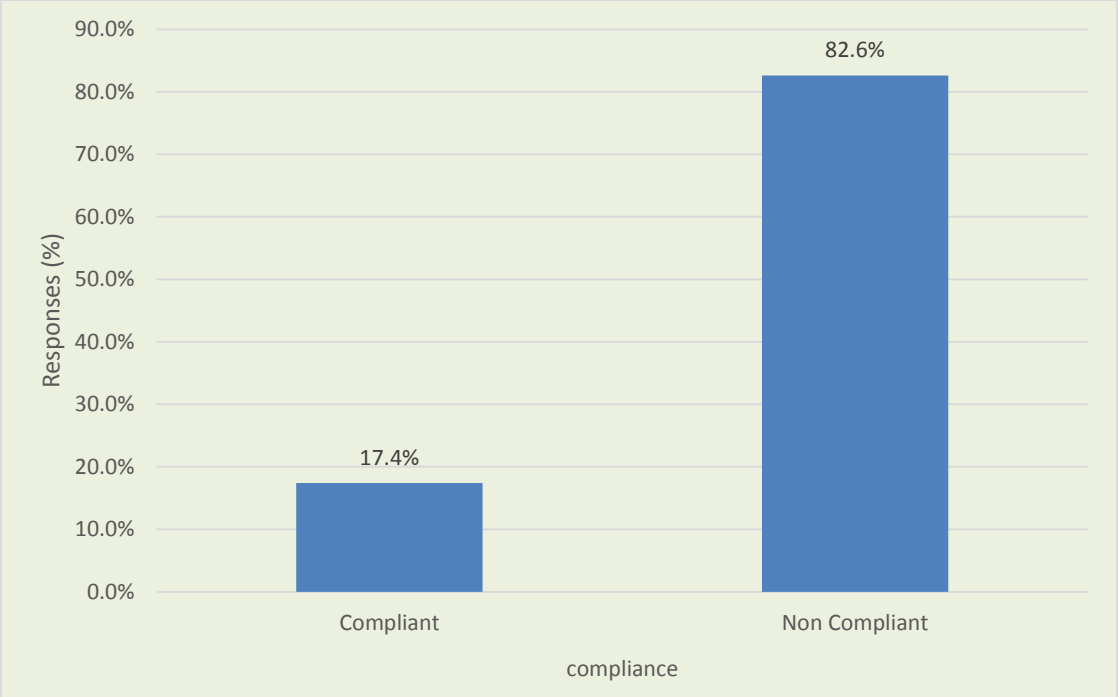


Figure 23: Distribution on compliance with neonatal resuscitation guidelines (n = 86)

Figure 23 above shows that most of the respondents (82.6%) deemed not to have complied with neonatal resuscitation guidelines while 17.4% of the respondents were deemed to have complied.

Table 9: Suggestion on how to improve compliance with the WHO neonatal resuscitation guidelines (multiple responses does not add up to 86)

Suggestions	Frequency	Percent
Constant supervision of the staff	18	23.4
Stick guidelines on the walls near the resuscitation	20	26.0
Conduct in house training	50	64.9
Orientation of staff to use of guideline	24	31.2
Purchase ideal resuscitation equipment	23	29.9
To have a team leader for neonatal resuscitation	8	10.4

According to table 9 above, most of the respondents (64.9%) suggested that conducting in house training would improve compliance while 10.4% suggested that having a team leader for neonatal resuscitation would help improve compliance with the WHO neonatal resuscitation guidelines.

4.8 SECTION G: ASSOCIATION BETWEEN STUDY VARIABLES

Table 10: Respondent's knowledge in relation to compliance with neonatal resuscitation guidelines

Knowledge	Compliance with neonatal resuscitation guidelines		Total	Chi square	p-value
	Compliance	Non Compliance			
High	13(16.0%)	68 (84.0%)	81 (100.0%)		
Low - Medium	2 (40.0%)	3 (60.0%)	5 (100.0%)		
Total	**15 (17.4%)**	**71 (86.6%)**	**86 (100.0%)**	1.876	0.208

According to table 10, out of 81 respondents with high knowledge, 84% of the respondents did not comply with the neonatal resuscitation guidelines while 16.0% of the respondents with high knowledge complied with the neonatal resuscitation guidelines. Furthermore, the Chi-square test (x^2=1.876, p = 0.208) on the association between knowledge and compliance with the WHO neonatal resuscitation guidelines showed no significant relationship between knowledge and compliance. Therefore, we failed to reject the null hypothesis that stated that there is an association between knowledge and compliance with neonatal resuscitation guidelines. The study concluded that there is no association between compliance with WHO neonatal resuscitation guidelines and the knowledge levels of medical doctors and midwives.

Table 11: Relationship between Attitude and Compliance with WHO neonatal resuscitation guidelines

Attitude	**Compliance with neonatal resuscitation guidelines**		**Total**	**Chi square**	**p-value**
	Compliance	**Non Compliance**			
Negative	4(15.4%)	22(84.6%)	26 (100.0%)		
Positive	11(18.3%)	49(81.7%)	60(100.0%)		
Total	**15 (17.4%)**	**71(82.6%)**	**86(100.0%)**	0.110	0.741

According to table 11 above, out of 26 respondents with negative attitude towards neonatal resuscitation 15.4% complied with guidelines while 84.6% did not comply. In respondents with positive attitude, compliance increased to 18.3% while non compliance decreased to 81.7%. Additionally, Table 11 shows the Chi-square test results ($_X^2$ = 0.110, p = 0.741). The results was found not to be statistically significant as the P-value was greater than 0.05. Therefore, we failed to reject the null hypothesis and concluded that there is no association between compliance with WHO neonatal resuscitation guidelines and the attitude of the medical doctors and midwives towards neonatal resuscitation.

Table 12: Respondents' in house training in relation to compliance with neonatal resuscitation guidelines

In house training	Compliance		Total	Chi square	p-value
	Compliance	Non compliance			
Adequate	5 (38.5%)	8 (61.5%)	13 (100%		
Inadequate	10 (13.7%)	63 (86.3%)	73 (100.0%)		
Total	**15 (17.4%)**	**71(82.6%)**	**86 (100%)**	4.699	0.030

According to table 12 above, majority of the respondents (86.3%) with inadequate in house training did not comply with neonatal resuscitation guidelines while 38.5% with adequate in house training complied with neonatal resuscitation guidelines. Furthermore, the Chi-square test results ($_X^2$ = 4.699, p – value = 0.030) on in house training showed a statistically significant relationship between in house training and compliance with the WHO neonatal resuscitation guidelines. Therefore, we rejected the null hypothesis that stated that there was no association between in house training and compliance with the WHO neonatal resuscitation guidelines.

Table 13: Relationship between availability of resuscitation equipment and compliance with the neonatal resuscitation guidelines

Availability of resuscitation equipment	Compliance with neonatal resuscitation guidelines		Total	Chi square	p-value
	Compliance	Non Compliance			
Available	5 (17.2%)	24 (82.8%)	29 (100.0%		
Not available	10 (17.5%)	47 (82.5%)	57 (100.0%		
Total	**15 (17.4%)**	**71 (82.6%)**	**86(100.0%)**	0.001	0.972

Table 13 shows that most of the respondents (82.5%) who mentioned that neonatal resuscitation equipment were available did not comply with the neonatal resuscitation guidelines while 17.2% of the respondents that mentioned that resuscitation equipment were available complied with the neonatal resuscitation guidelines. Chi-square = 0.001, p – value = 0.972. The results revealed no statistically significant association between availability with neonatal resuscitation equipment and compliance with the WHO neonatal resuscitation guidelines.

Table 14: Relationship between compliance and years of experience

Years of experience	**Compliance with neonatal resuscitation guidelines**		**Total**	**Chi square**	**p-value**
	Compliance	**Non Compliance**			
0 – 10 Years	34(82.9%)	7 (17.1%)	41 (100.0%)		
10 – 20 Years	26 (83.9%)	5(16.1%)	31 (100.0%)		
Above 20 Years	11(78.6%)	3(21.4%)	14(100%)		
Total	**71 (82.6%)**	**15 (17.4%)**	**86 (100.0%)**	0.196	0.907

According to table 14, most of the respondents (82.9%) with years of experience ranging from 0 – 10 years complied with the WHO neonatal resuscitation guidelines while 21.4% of the respondents with experience above 20 years did not comply with the WHO neonatal resuscitation guidelines. Chi square test =0.196, N=86, p = 0.907. The observed relationship between years of experience and compliance was found not to be statistically significant (P-value 0.907). Hence we failed to reject the null hypothesis and conclude that there is no association between years of experience and compliance with resuscitation guidelines.

Table15: Relationship between compliance and health profession

Health profession	Compliance with neonatal resuscitation guidelines		Total	Chi square	p-value
	Compliance	Non Compliance			
Midwives	66 (81.5%)	15 (18.5%)	81 (100.0%)		
Medical doctors	5 (100%)	0 (0%)	5 (100.0%		
Total	**71 (82.6%)**	**15 (17.4%)**	**86(100.0%)**	**1.112**	**0.290**

According to Tables 15 above, all the medical doctors (100%) complied with the WHO neonatal resuscitation guidelines while 18.5% of the respondents who were midwives did not comply with WHO neonatal resuscitation guidelines. The Chi square test results (x^2=1.122, p = 0.290) on health profession showed no statistically significant relationship between health profession and compliance with the WHO neonatal resuscitation guidelines. Hence we failed to reject the null hypothesis states that there is an association between health profession and compliance with the WHO neonatal resuscitation guidelines. Therefore, these results concluded that there is no association between the health profession of the respondents and their compliance with resuscitation guidelines.

4.9 SECTION H: OBSERVATION OF NEONATAL RESUSCITATION PROCEDURE

Table 16: professional categories observed conducting neonatal resuscitation

Professional categories observed	Frequency	Percentage
Registered midwives	6	30
Enrolled midwives	10	50
Certified midwives	4	20
Total	**20**	**100**

Table 16 shows that, most of the respondents 50% observed conducting neonatal resuscitation were the enrolled midwives while 20% of the medical doctors were observed.

Table 17: Compliance with neonatal resuscitation steps

Compliance with neonatal resuscitation steps	Frequency	Percentage
A. Assessment		
Compliance	6	30
Non compliance	14	70
Total	20	100
B. Breathing		
Compliance	4	20
Non compliance	16	80
Total	20	100
C. Oxygen administration		
Compliance	6	30
Non compliance	14	70
Total	20	100

Table 17 shows that, out of the ten steps observed on assessment, majority of the respondents 70% did not comply with the steps while 30% of the respondents complied with steps on assessment.

Majority of the respondents 80% did not comply with the steps of resuscitation to initiate breathing while 20% of the respondents complied with the guidelines.

On administration of oxygen to the neonate during resuscitation, majority 70% of the respondents did not comply with the steps while 30% of the respondents complied with the steps.

Table 18: Distribution of compliance with neonatal resuscitation procedure

Compliance with neonatal resuscitation	**Frequency**	**Percent**
Yes	4	20
No	16	80
Total	**20**	**100**

According to table 18, most of the respondents 80% did not comply with neonatal resuscitation guidelines while the minority 20% complied with the neonatal resuscitation guidelines.

Table 19: Observation checklist on neonatal resuscitation equipment

Clinical site	**Available**	
	Frequent	**percentage**
Clinics		
Buchi	15	55
Chimwemwe	21	78
Ndeke	15	55
Luangwa	15	55
Kitwe Central Hospital		
Luena	17	63
Scbu	20	74
Lukulu	21	78

Table 19 shows that, out of the 27 neonatal resuscitation equipment from the checklist, Lukulu ward and Chimwemwe health centre had 78% of the listed neonatal resuscitation equipment present and in working condition while Buchi and Ndeke health centre had 55% (15) of the neonatal resuscitation equipment available.

Table 20: Observation checklist for neonatal resuscitation protocols

Clinical sites	Frequency	Percentage
Kitwe central hospital		
Luena ward	4	66.6
Lukulu ward	5	83.0
SCBU	3	50.0
Clinics		
Chimwemwe	1	16.6
Buchi	4	66.6
Ndeke	2	33.3
Luangwa	3	50.0

According to table 20, out of the six neonatal resuscitation protocols, Lukulu ward had majority 83% of the neonatal resuscitation protocols displayed while Chimwemwe health centre had 16.6% of the protocols displayed.

Table 21: Multivariate binary logistic regression model on factors affecting compliance with neonatal resuscitation guidelines

Variable	P < 0.05	Odd ratio	(CI 95%)
Knowledge in mental health			
High knowledge	**0.208**	5.007	0.706 – 35.495
Low- medium knowledge			
Attitude			
Positive	**0.741**	1.476	0.376 – 5.797
Negative			
In house training			
Adequate	**0. 030**	1.143	0.318 – 4.114
Inadequate			
Availability of neonatal resuscitation equipment			
Available	**0.972**	5.163	1.296 – 20.568
Not available			

Table 21 shows that in house training (p-value = 0.030) was the most predictor variable in this study which was statically significance to comply with the WHO neonatal resuscitation guidelines compared to the knowledge, attitude and availability of neonatal equipment.

CHAPTER FIVE

5.0 DISCUSSION OF THE FINDINGS

5.1 Introductions

Compliance is one factor that contributes to the medical doctors and midwives practice towards neonatal resuscitation. Complying with the WHO neonatal resuscitation guidelines helps the doctors to reduce neonatal mortality as they conduct deliveries and assist the neonates to initiate spontaneous respirations. Medical doctors and midwives are basically trained to resuscitate neonates. In addition they are sent for in house training on neonatal resuscitation. Non compliance to the guidelines results in the short term morbidity and long term disabilities that are discovered later in the developmental stages of the infant.

The respondents in the study were medical doctors and midwives of different categories as illustrated in Table 2 who were working at Kitwe Central Hospital delivery wards and health centers that were offering 24 hours maternity service in the Kitwe District. The results of this study were based on the analysis of the responses from the sample size of 86.

The study sought to determine compliance with the WHO neonatal resuscitation guidelines. Compliance with the WHO neonatal resuscitation guidelines was determined through the use of the interview schedule and the observation checklist. The finding of the study revealed that most 82.6% of the respondents did not comply with the WHO neonatal resuscitation guidelines (Figure 20). Furthermore, the observation checklist revealed that 80% of the respondents did not comply with the steps of the neonatal resuscitation procedure.

5.2 DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Majority of the respondents (84.9%) were females while 15.1% were males (Table 2). This study was consistent with Murila's (2012) study conducted in Kenya in which 56.8% of the respondents were females and 43.2% were males. This demonstrates that obstetrics is still a female dominated field today as it was in the past.

This is also emphasized in the recruitment and selection guidelines with regard to the male to female ratio of 1: 4 prescribed by the General Nursing Council of Zambia (GNC, 2010). However, the selection criterion for medical doctors is different as they compete for the quotas in the school of medicine on merit from the school of natural sciences. The ratios in terms of gender are not applicable.

The study sample consisted of medical doctors and midwives with the age range from 20 – 61 years. The mean (SD) age of the respondents was 41.4±10.2 years. About 34.9% of the respondents were aged between 31 – 40 years and 2.3% of the respondents were aged 61 years and above (Table 2). This is attributed to the fact that most of the professionals have gained some experience and they would like to specialize in their career. This finding is contrary to Faiza's (2011) findings in Khartoum where majority of the nurse midwives (70%) were aged more than 40 years of age. This shows that there were more youths among the medical doctors and midwives working in the maternity wards and clinics in Kitwe district. This is a vibrant and energetic age group which can easily enhance compliance with neonatal resuscitation guidelines provided they receive adequate knowledge update on the neonatal resuscitation.

As shown in Table 2 the study revealed that most of the respondents (45.3%) were enrolled midwives whereas the registered midwives were 39.5%. This is contrary to Louis' (2013) finding in a study conducted in Haryana district where 47% of the respondents were staff nurses, 19% were auxiliary nurse midwives and 29% were doctors. The findings of the current research could be attributed to the fact that some registered midwives were appointed to managerial position as nursing sisters.

The present study revealed 31.4% of the respondents had experience ranging from 0-5 years (Table 2). The findings are in line with Gebreegziabher (2014) in North Ethiopia where the periods of experience of 19.3%, 28.9%, 25.9%, 25.2% and 26.7% participants were < 1 year, 1-3 years, 4- 5years and > 5 years respectively. This was due to the fact that most of the medical Doctors and midwives in this category had just completed their post graduation training and they were still new in the specialty.

As indicated in Table 2, 44.2% of the respondents worked in the hospital labour ward, 20.9% (18) worked in the special care baby unit within the labour. The hospital had a high number of midwives as it was the third level hospital and the referral centre at the same time. The establishment for medical doctors and midwives was more at the hospital than in the health centers.

5.3. DISCUSSION OF VARIABLES

5.3.1 Compliance with neonatal resuscitation

Competency in neonatal resuscitation is critical in the delivery rooms, neonatology units and paediatrics intensive care units to ensure the safety and health of neonates (Gebreegziabher, 2014). Compliance with Neonatal resuscitation guidelines is effective only when health professionals have sufficient knowledge and skills.

This study revealed that majority (82.6%) of the respondents did not comply while a few (17.4%) of the respondents did comply with the WHO neonatal resuscitation guidelines (Figure 20). The observations also revealed non compliance of 80% (Figure 23). This could be attributed to inadequate in house training and non availability of neonatal resuscitation equipment and protocols. These findings are in line with Msemo et al. (2013) in Tanzania which revealed non compliance with neonatal resuscitation among the master trainers. The setting of the study included the three (3) referral hospitals, four (4) associated referral hospitals and one (1) district hospital. This was dissimilar with the current study setting that included one referral hospital and four (4) health centers. Despite the dissimilarity in the study setting the results were similar. Therefore, we can say that working in higher level hospitals does not guarantee someone to comply with the WHO neonatal resuscitation guidelines.

In addition, Mutungi et al. (2008) in Kenya reported that in general, the competency of health personnel at performing basic, life-saving skills was quite low. Many providers reported that their practice was to refer a patient to the next highest level of care as soon as any complication arose. This could indicate that health personnel refer complicated cases to avoid deaths in their facility.

This is contrary to our health personnel in Kitwe district health centres. They refer most of the cases to the hospital in order to have more time to rest in the night.

Likewise, Gill and Colvin (2007) in Australia reported inconsistent compliance with published guidelines. The study also revealed that forty – two percent of infants received Naloxone without documentation of prior ventilation support. The study concluded that despite a steady decrease in the use of Naloxone for neonatal resuscitation, there was a considerable lack of compliance with the published guidelines for the use of Naloxone. However, Kim et al. (2013) in Afghanistan reported compliance with the WHO neonatal resuscitation among the respondents. This discrepancy could have been due to the availability of simulation-based training, updating training, and certification process before graduation in Afghanistan which is not existed in our case. Certification of health personnel before graduation enhances compliance. Therefore, the General Nursing Council should consider certification of newly qualified staff in all life saving procedures (which include neonatal resuscitation) before they are registered for practice.

The study findings have revealed that compliance with the WHO neonatal resuscitation guidelines is associated with in- house training as indicated in Table 12, Where (38.5%) of the respondents that were adequately trained complied with the WHO neonatal resuscitation guidelines. Chi-square test results ($_X^2$ = 4.699, df = 1, p – value = 0.030) rejecting the null hypothesis which states that there was no relationship between in house training on neonatal resuscitation and compliance with the WHO neonatal resuscitation guidelines. Therefore, this study concluded that there is an association between compliance with the WHO neonatal resuscitation guidelines and in house training of the medical doctors and midwives.

5.3.2 Knowledge about neonatal resuscitation by medical doctors and midwives

Knowledge is one of the crucial aspects of health systems to adherence to essential of immediate newborn care practices as first step for resuscitation and prevention of further complication at hospital based level (Faiza, 2011). Knowledge encompasses the skills, experiences and insights of practicing health care providers applied to maintain or improve their practice (Prince et al., 2009).

In this study 70.9% of the respondents had medium knowledge levels on neonatal resuscitation (Figure 8). This could be attributed to unavailability of the neonatal resuscitation protocols, non availability of the team leader to enhance knowledge and inadequate in house training. However, 23.3% of the respondents had low knowledge. Similarly, in a study by Khan (2011) conducted in south America, it was reported that many health personnel had limited knowledge of neonatal resuscitation and were yet faced with high numbers of resuscitations largely poorly executed. Enweronu-Laryea (2009) in West Africa also found that 43.9% of the respondents had low knowledge in his study. The low level of performance was attributed to limited exposure to real cardiopulmonary resuscitation cases during the undergraduate course, lack of certification processes before leaving the university and updating training. We can, therefore, safely say that lack of exposure to real neonatal resuscitation procedure can comprise the quality of resuscitation rendered to the neonate at or few hours after birth.

In addition, a study by Gebreegziabher et al. (2014) in North West Ethiopia revealed that the knowledge and skill levels of midwives, nurses, paediatrics residents and obstetrics -gynaecology residents about neonatal resuscitation were sub-standard (<80%). This study had a wider sample size than our current study as it took into consideration the nurses and paediatrics residents. Future research could be considered to include nurses and paediatricians in order to have a sample that will be representative in nature.

Furthermore, Trevisanunuto (2007) in Sudan revealed that 51.9 % of the respondents had low knowledge. The difference in the score might be due to the difference in the quality of the training given to the residents and the facilities available. Murila (2012) in a study conducted in Kenya showed that more than 70% of the health professionals considered their knowledge about neonatal resuscitation to be inadequate because of inadequate medical training. Similarly, the study by Ogunlesi (2012) in Western Nigeria found that the knowledge of nurses about neonatal resuscitation was poor. This shows that there were no differences in terms of practice between western and southern African countries. Nonetheless, Taksande et al. (2012) in India reported high (69.1%) knowledge on use of resuscitation guidelines. The discrepancy could be due to the difference in the quality of training on neonatal resuscitation and the facilities available for neonatal resuscitation. Furthermore, Ezenduka (2015) in Nigeria revealed that 83% of the nurses involved in the management of birth asphyxia in Federal Medical Center Asaba had good level of knowledge required for successful management of birth asphyxia. The high knowledge observed may be attributed to the training that they had.

The findings have revealed that knowledge is not associated with compliance with the WHO neonatal resuscitation guidelines as shown in Table 10 where out of 81 respondents that had high knowledge 84% did not comply with the WHO neonatal resuscitation guidelines. Chi-square test results (X^2 =1.876, df = 1, N=86 and p = 0.208) revealed there was statistically insignificant difference between knowledge and compliance. Therefore, we failed to reject the null hypothesis that stated that there is an association between knowledge and compliance with neonatal resuscitation guidelines was accepted. The study concluded that there was no sufficient evidence to prove that there was an association between compliance with WHO neonatal resuscitation guidelines and the knowledge levels of medical doctors and midwives.

5.3.3 Medical doctors and midwives' Attitude towards neonatal resuscitation

Positive attitude comes about when the medical doctors and midwives know what they are doing and are well motivated with the good working environment that promote constant staff supervision, in house training as well as adequate staffing. Therefore attitude is purported to be another factor contributing to the medical doctors and midwives' compliance with the WHO neonatal resuscitation guidelines.

This study revealed that majority (69.8%) of the respondents had positive attitude towards compliance with the WHO neonatal resuscitation while 30.2% of the respondents had negative attitude (Figure 9). Melanie et al. (2008) in a study entitled Attitudes of Neonatologists toward Delivery Room Management of Confirmed Trisomy 18: Potential Factors Influencing a Changing Dynamic, indicated that more providers (44%) than anticipated would consider initiation of resuscitation for an infant with trisomy 18 even with congenital heart disease. Trisomy 18 (Edward syndrome) is a chromosomal abnormality caused by the presence of an extra 18^{th} chromosome.

This study concluded that there was universal consensus that trisomy 18 was a lethal anomaly for which resuscitation in the delivery room was not indicated. It was speculated that support for the best-interest standard for neonates was diminishing in favour of ceding without question to parental autonomy. However, the WHO (2009) guide recommends that the following should not be resuscitated: still-births that are not fresh; the newborn with a "severe malformation" (hydrocephaly, anencephaly, trisomy 13 or 18, short-limbed dwarfism, multiple defects); "extremely low gestational age" to be determined by local policy and probability of survival.

Table 11 further revealed that out of 60 respondents that had positive attitude towards neonatal resuscitation 81.7% of the respondents did not comply with the WHO neonatal resuscitation guidelines. We can say that having good attitude does not guarantee someone to comply with WHO neonatal resuscitation guidelines.

Chi square test results (X^2 =0.110, df = 1, N=86, p=0.741) revealed that the observed pattern was found not to be statistically significant as the P-value was greater than 0.05. We failed to reject the null hypothesis and concluded that there was no sufficient evidence to show that there was an association between compliance with WHO neonatal resuscitation guidelines and the attitude of the medical doctors and midwives towards neonatal resuscitation. The odds of complying for respondents with positive attitude were 1.476 times higher than for those with negative attitude.

5.3.4 In House Training on neonatal resuscitation for medical doctors and midwives

Neonatal resuscitation training enhances knowledge and skill to function as an effective member of a neonatal resuscitation team. This study revealed that majority (84.9%) of the respondents had inadequate training while a few (15.1%) of the respondents had adequate training on neonatal resuscitation (Figure 12). According to a study by Young (2013) in Columbia more than 80% of the health care providers had been trained on newborn resuscitation, but midwives were more likely than doctors to receive such training as part of pre-service education. In the same study, no significant differences were found between doctors and midwives on knowledge, clinical skills, or confidence in performing newborn resuscitation. Doctors and midwives scored 71% and 66%, respectively, on knowledge questions and 66% and 71% on the skills assessment; 75% of doctors and 83% of midwives felt very confident in their ability to perform newborn resuscitation. Future researchers should consider using a comparative study design to allow for comparisons between the midwives and doctors as was the case in the Columbian study.

A study by Carlo et al., (2009) conducted in a developing country (Zambia) revealed that after training, knowledge improved significantly from 43 - 71% to 68 – 92%; skills improved the most from 22 – 64% to 79 – 97; self-efficacy scores improved from 60 - 88% to 80% - 100%). Pre-training knowledge and skills scores were relatively low despite the advanced formal education and experience of the participants, whereas the self-efficacy scores were high.

Neonatal resuscitation program training has the potential to substantially improve knowledge and skills of neonatal resuscitation.

Patel et al. (2001) in USA found little evidence to show that Neonatal Resuscitation Program (NRP) impact on infant mortality. Similarly, Jabir et al. (2009) in Iraq reported participation in Neonatal Resuscitation Program improved the participant's knowledge levels, however, their performance on clinical simulations was unsatisfactory, suggesting that this aspect needs to be improved. According to Table 12, out of 13 respondents that that had adequate in house training 61.5% of the respondents did not comply with the WHO neonatal resuscitation guidelines. Chi square test results (X^2 =4.699, DF = 1, N=86, $p < 0.05$) were statistically significant and hence the null hypothesis was rejected. The study concluded that there was an association between compliance with the WHO neonatal resuscitation guidelines and in house training of the medical doctors and midwives. The odds of complying with WHO guidelines for those who had received adequate in house training were 5.163 times higher than for those who had not received adequate in house training.

5.3.5 Availability of neonatal resuscitation equipment

Neonatal resuscitation equipment is indispensable in conducting resuscitation. Neonatal resuscitation equipment can either be basic or comprehensive equipment. All the delivery centres should have at least the basic neonatal resuscitation equipment in order to help the babies initiate respirations at birth.

Neonatal ehandbook (2014) states that checking of equipment is essential and resuscitation equipment should be checked at least daily and after each usage. When use is anticipated at a birth recheck equipment including medical air and oxygen supply, suction, positive pressure devices, resuscitation equipment, laryngoscope and endotracheal tubes. If an infant is expected to be in poor condition have medication readily available (e.g. O negative red blood cells and 0.9% normal saline in the presence of massive antepartum haemorrhage).

The current study revealed that 66% of the neonatal resuscitation equipment was available while 34% was not available (Figure 16). Furthermore, the observation checklist revealed that neonatal resuscitation equipment was available at 55% - 78% (Table 19). However, Young et al. (2013) in Columbia reported 81% - 100% availability of neonatal resuscitation equipment. This probably could be one of the reasons for non compliance with the WHO neonatal resuscitation guidelines in our district.

According to Couper et al. (2005) and Pattinson et al. (2005), the South African Department of Health (DOH) policy ensures that appropriate neonatal resuscitators are available at every birth and used correctly. This was considered to be critically important in the management of birth asphyxia and in minimizing its associated sequelae. However, the lack of adequate neonatal resuscitation equipment and poor neonatal resuscitation skills amongst health care providers had been identified as contributing factors in these often avoidable neonatal deaths. Furthermore, Sibiya, (2014) in South Africa revealed that work integrated learning is vital for development of clinical skills among Primary Health Care post basic nursing. Nevertheless, inadequate materials, non human resources, lack of supervision and insufficient practice in the clinical skills were identified as challenges that students experience. It is therefore, important to ensure that those with expertise are allocated to work with the staff with less expertise for work integrated learning to take place.

However, Opiyo et al. (2006) reported that where resources are limited, it should be possible to improve neonatal outcomes through promotion of the effective use of a bag-valve-mask alone, without access to more sophisticated and expensive technologies. Basic, effective resuscitation should therefore be available at all health facilities and potentially in the community. This could probably mean that where the resources are limited at least basic resuscitative equipment should be available and used correctly to save life. The study has revealed that out of 29 respondents that indicated that neonatal resuscitation equipment was available 82.8% of the respondents did not comply with the WHO neonatal resuscitation guidelines (Table 13). Chi square test ($x^2 = 0.001$, df =1, p = 0.972).

The findings were not statistically significant. Therefore the null hypothesis which stated that there was an association between availability of neonatal resuscitation equipment and compliance with the WHO neonatal resuscitation guidelines was rejected. The study concluded that there was no association between availability of neonatal resuscitation equipment and compliance with the WHO neonatal resuscitation.

5.3.6 Associations among major study variables

Multivariate binary regression analysis model was used to determine amongst the variable s which were entered into the model were predictors of compliance the WHO neonatal resuscitation guidelines. Table 21 showed that in house training was associated with compliance with the WHO neonatal resuscitation guidelines (x^2= 4.699; P = 0.030). However, this study revealed that there was no statistically significance observed on knowledge (x^2= 1.876; p= 0.208), attitude (x^2= 0.110; p = 0.741) and availability of neonatal resuscitation equipment(x^2= 0.001; p= 0.972). Similarly the Theory of Reasoned Action on which this study was used to provide the theoretical framework on which this study was based revealed that training could be one of the factors influencing compliance with the WHO neonatal resuscitation guidelines.

This study revealed that the odds of complying with WHO guidelines for those who had received adequate refresher courses were 5.163 times higher than for those who had no received adequate refresher courses (Table 21). This is in agreement with Young et al. (2013) in Columbia where training was associated with greater knowledge and clinical skills. Training was associated with greater knowledge ($p < 0.001$) and clinical skills ($p < 0.05$) in a multivariable model that adjusted for facility type, provider type, and years of experience offering EmONC services. He further stated that lack of equipment and training do not pose major barriers to newborn resuscitation in Afghanistan, but providers' knowledge and skills need strengthening in some areas. However, the findings by Ezenduka et al (2015) in federal medical centre Asaba, Nigeria revealed that there was no significant difference ($p > .05$) in attitude of the nurses to the practice of management of birth asphyxia. This was a descriptive survey research design.

The current study that used the cross sectional descriptive study design revealed medical doctors and midwives had positive attitude (69.8%) and non compliance (82.6%). Despite the fact that the medical doctors and midwives had good attitude the Multivariate Binary Regression Analysis model revealed that attitude was statistically insignificant (p=0.741). It is therefore, evident from the two different research designs that attitude of health personnel was a confounder to the main research variables. We can further postulate that positive attitude coupled with poor knowledge among medical doctors and midwives is very dangerous as this will continue to impinge on compliance with neonatal resuscitation guidelines.

5.4 NURSING IMPLICATIONS

5.4.1 Nursing Practice

All the neonates that are born within the safe delivery centres pass through the hands of the trained staff. The neonatal care given by the patients need to be adequate and efficient in order to yield better results and prevent brain insult to the neonates. This implies that the medical doctors and midwives need to be adequately prepared to practice the correct neonatal resuscitation procedure as prescribed by the WHO set standards to prevent neonatal deaths occurring in the first week of delivery. This will help to reduce the long effects of oxygen deprivation to the neonate and will help to improve the neonatal care. The study revealed that most (82.6%) of the respondents did not comply with the neonatal resuscitation guideline. Similarly the observation checklist revealed that most 80% of the respondents were non compliant with the neonatal resuscitation procedure. Non compliance could be due to inadequate training as majority 84.9% indicated that they had only attended a single in house training. It was attributed to non availability of neonatal resuscitation equipment as the majority (66%) of the respondents asserted to.

The study also revealed that 64% of the respondents had not seen an ideal neonatal resuscitaire (Figure 15). This could be attributed to non availability of neonatal resuscitation equipment. Furthermore Table 19 revealed that, the observation checklist on equipment revealed that the hospital and the clinics were at par in terms of availability of neonatal resuscitation equipment. Buchi health centre and Lukulu labour ward had 78% of the neonatal equipment available.

The availability of neonatal resuscitation equipment probably motivates the medical doctors and midwives to comply with the WHO neonatal resuscitation guidelines.

The study also revealed that out of six neonatal resuscitation protocols, Lukulu labour ward had most 83% neonatal resuscitation protocols available and displayed in the rightful resuscitation bay while Chimwemwe health centre had 16.6% of the neonatal resuscitation protocol available and stuck to the wall (Table 20). It was observed that the protocols were available in some delivery site except that there were stuck away from the resuscitating bay. This probably made it difficult for the midwives and doctors to adhere to them.

5.4.2 Nursing Education

Mayor (2002) states that education "is the process of providing information about an important issue." The study revealed that 84.9% of the respondents did not receive adequate training on neonatal resuscitation (Figure 12). A medical doctor/midwife who did not receive adequate training on neonatal resuscitation is less likely to use the guideline because she/he will lack the knowledge competencies. Some differences were observed in performing the procedure as some of the midwives still used methylated spirit during resuscitation to stimulate the neonate to start breathing. It is therefore necessary for midwifery trainers to standard neonatal resuscitation through in house training and emphasise the importance of adhering to the new protocols on resuscitation rather than the traditional way of resuscitating the newborn.

5.4.3 Nursing Research

Nursing research is a systematic detailed attempt to discover or confirm the facts that relate to a specific nursing problem (Basavanthappa, 2007). Neonatal resuscitation is an important procedure in the care of the neonate at birth. Inadequate research has been conducted to assess compliance with WHO neonatal resuscitation guidelines by among the medical doctors and the midwives in Zambia. The practice of medical doctors and midwives cannot be improved without evidence based knowledge through conducting research.

With this research, much attention should be given to the medical doctors and midwives to ensure that have adequate knowledge and positive attitude to enhance compliance with the WHO neonatal resuscitation guidelines. This will help to meet the sustainable goals on reduction of neonatal / perinatal morbidity and mortality. Further research to evaluate the impact of EmONC and HBB training on the provision of immediate neonatal care among the health workers should be conducted. A comparative study to evaluate the skills competencies among health practitioners in delivery centres should be conducted in future.

5.4.4 Nursing Administration

Nursing administration is an integral part of nursing practice. Nursing managers need to plan and formulate goals and strategies that will help to enhance compliance with neonatal resuscitation guidelines. This can be achieved by lobbying for more training of midwives in Helping Babies Breathe, more equipment and constant supervision of the nurses in the clinical area to enhance compliance. The study revealed that most 77.9% of the respondents mentioned that they did not have a team leader during resuscitation while 22.1% did indicate that they had a team leader (Figure 21). Furthermore out of 19 respondents that indicated that they had a team leader 57.9% of the respondents indicated that the team leader was not available during the actual resuscitation procedure (Figure 22). Nursing managers should be instrumental in ensuring that the neonatal resuscitation teams are formulated where they are not in existence and quiescent teams are stimulated to work actively to enhance the transfer of knowledge and skill to other members. The presence of the team leader would probably motivate the medical doctors and midwives to comply with neonatal resuscitation guidelines.

5.5 Conclusion and Recommendations

5.5.1 Conclusion

The study was conducted in order to determine compliance with WHO neonatal resuscitation among the medical doctors and midwives in Kitwe district delivery centres. Most of the studies revealed non compliance with the WHO neonatal resuscitation guidelines. The findings of the current study revealed non compliance with the neonatal resuscitation guidelines.

Further studies require to be done to find out why most of the countries' results revealed non compliance with the WHO neonatal resuscitation guidelines. A multicentric study should be conducted to assess the intervention employed by different countries in order to enhance compliance.

5.5.2 Recommendations

5.5.2.1 To the Ministry of Health

The Ministry of Health should:

1. Ensure the provision of adequate resources including resuscitation equipment to the hospitals and clinics
2. Consider increasing the grant allocation to the district and hospital so that more trainings and resuscitation equipment can easily be conducted and purchased, serviced and replaced respectively.
3. Conducting a national wide survey on neonatal resuscitation in order to have representative report on neonatal resuscitation.
4. Ensure that all the medical doctors and midwives are trained in HBB and EmONC in the hospitals and health centres.

5.5.2.2 The District Health Office

The district health office should:

1. Work with the hospital to formulate a neonatal resuscitation form which should be uniformly used by the district health centres and labour wards to report on the care given to the neonatal during resuscitation
2. Combine efforts with the hospital to come up with a professional audit team for midwifery practice. This will help to promote the standardisation of practice and enhance the spirit of commitment to the practices.
3. Equip the entire health centres with proper neonatal resuscitation equipment and the surgical /medical supplies required for the procedure especially in the busy maternity clinics.
4. Ensure that all protocols and guidelines on neonatal resuscitation should be displayed in the neonatal resuscitation bay.

5.5.2.3 The General Nursing Council

The General Nursing council of Zambia should:

1. Enhance the inspection of midwifery practice in the country to reinforce compliance with the set standards on neonatal resuscitation.
2. Ensure that the traditional methods of resuscitation that are being practiced in some areas are done away with by standardising the procedure and ensuring the schools are teaching the recommenced WHO neonatal resuscitation guidelines.
3. Introduce the certification of nurses and midwives in life saving skills before graduation in order to enhance the compliance.

5.5.2.4 Kitwe Central Hospital

The hospital should:

1. Create an in service training unit that will undertake periodic trainings on neonatal resuscitation for the institutions. This will prevent lapses in offering in house training to staff.
2. Ensure that all the midwives are given equal opportunity to attend workshops/ orientation on neonatal resuscitation.
3. Consider establishment of resuscitation teams and appointments of resuscitation team leaders for every shift in order to continue mentorship of new on this vital procedure
4. Ensure that the obstetrical team conduct constant supervision in the maternity wards to enhance the skills
5. Consider allocating a permanent doctors to the labour wards to be present when these procedures are been conducted. Doctors only come to the wards when called for any complications and to discharge postnatal mothers. Allocation of doctors to the ward will accord them chance to take part in neonatal resuscitation procedure.
6. Enhanced Clinical drills on neonatal resuscitation in the wards and clinics using the mannequins to simulate the actual procedure in order to update the staff on neonatal resuscitation.
7. Ensure that each delivery room has complete neonatal resuscitation equipment and accessories. Single working resuscitation equipment is not ideal for busy centres.

5.5.2.5 To the future researchers

1. The findings of this research were from one hospital and four health centres, it will be important to conduct research that will be from several hospitals and health centres.
2. Most of the countries that have conducted research have revealed non compliance with neonatal resuscitation guidelines therefore a study to evaluate clinical interventions in the provision of neonatal resuscitations is recommended.
3. An evaluation of the neonatal resuscitation training provided under helping babies breath (Midwives Association of Zambia), Emergency Obstetric and Newborn care (Ministry of Health - cooperating partners) and neonatal resuscitation training (prescribed General Nursing Council) needs to be done to standardise neonatal resuscitation.

5.6 Dissemination of Findings

The dissemination of findings entails that the researcher would undertake measures to avail the information to the relevant authorities and the research subjects on what the study measured. The copies of the research findings will be sent to the University of Zambia School Of Medicine, Ministry of Health, Copperbelt Health Office, Kitwe Distract Health Office, Kitwe Central Hospital and one will be for the investigator. The findings of the study will be published in the reputable journal

5.7 Limitations of the Study

a. Due to limited resources, the study was conducted with a small sample size of 86 respondents. This means that the findings of the study cannot be generalised to all medical doctors and midwives in the country.
b. Twenty out of 86 respondents were observed conducting neonatal resuscitation. The study could not associate observed neonatal resuscitation procedure with compliance as the respondents were not given the exact codes for follow up. This means that the results on checklist observations were not associated with the dependent variable. Only midwives were observed resuscitating the neonate.

The medical doctors were not observed because they were not stationed in the labour ward. They only came to the labour ward when they were called upon. The resuscitation of the neonate was almost complete by the time the medical arrived on the ward. It was also difficult to observe the medical doctors using stimulation. The future studies should evaluate compliance of medical doctors with the WHO neonatal resuscitation using simulations and videos.

c. The study included the medical doctors and midwives trained in Zambia. All the medical doctors and midwives trained outside the Zambia were excluded. It would have been possible that foreign trained medical doctors and midwives trained had the ability to comply with the WHO neonatal resuscitation guidelines. Therefore their inclusion would have provided broader scope into the ability to comply with the WHO neonatal resuscitation guidelines.

REFERENCES

Ajzen, I & Fishbein, M. 1980. Understanding Attitudes and Predicting Social Behaviour, Englewood cliffs, NJ: Prentice Hall.

American Association for Respiratory Care. Clinical Practice Guideline: resuscitation in the acute care hospital. Respiratory Care, 1993; 38(12):1179-1188.

Bandura, A & Ross, D. 1977. "Analysis of self Efficacy Theory of Behavioural Change", in Social Psychology, Robert, B., A and Donn, B (2004), 10th Edition, 133 – 147 Pearson Education India.

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. J. Perinatal. 25(Suppl. 1):S82–S91

Basavanthappa, B., T. 2001. Nursing Research, 2nd Edition, Jaypee, New Delhi. Ltd. New Delhi.

Basavanthappa, B., T. 2007. Nursing Research, 2nd Edition, Jaypee, New Delhi. Ltd. New Delhi.

Bassom, A., A & Uys. H., H. 2000. Research Methodology in Nursing. Kegiso Tertiary, Cape Town.

Basavanthappa, B., T. 2007. Nursing Research, 2nd Edition, Jaypee, New Delhi. Ltd. New Delhi.

Berdowski, J., Schmohl, A., Tijssen, J., G. & Koster, R., W*. 2009.* Time needed for a regional emergency medical system to implement resuscitation guidelines 2005–the Netherlands experience*.* Resuscitation. *80:1336 –1341*.

Bigham, B., L., Koprowicz, K., Aufderheide, T., P., Davis, D., P., Donn, S., Powell, J., Suffoletto, B., Nafziger, S., Stouffer, J., Idris, A & Morrison, L.,J. 2010. Delayed pre-hospital implementation of the 2005 American heart association guidelines for cardiopulmonary resuscitation and emergency cardiac care. Pre-hospital Emergency Care.

Black, R., E., Johnson, H., L., Lawn, J., E., Rudan, I., Bassani, D., G., Jha, P., Campbell, H., Walker, C., F., Cibulskis, R., Eisele, T., Liu, L.& Mathers, C. 2010. Child Health Epidemiology Reference Group of WHO and UNICEF, Global, regional, and national causes of child mortality in 2008: a systematic analysis. *Lancet,* **375** (9730)**:**1969-1987.

Carbine, D., N., Finer, N., N., Knode, I., E. & Rich, W. 2000. Using a Video Recording as means of Evaluating Neonatal resuscitation performance in USA.

Carlo, W.,A, Wright, L., L., Chomba, E., McClure, E., M., Carlo, M., E., Bann, C., M., et al. 2009. Educational impact of the neonatal resuscitation program in low-risk delivery centers in a developing country. Journal of Pediatrics; 154(4):504–8.

Chamberlain, D., A., Hazinski, M., F. 2003. Education in resuscitation. *Resuscitation* 59:11– 43.

Chikuse, B., Chirwa, E., Maluwa, A., Malata, A. and Odland J., 2012. Midwives' adherence to guidelines on the management of birth asphyxia in Malawi. Open Journal of Nursing, 2, 351-357.doi:10.4236/ojn.24052

Chomba, E., M^{C} Clure, E. M., Wright ,L.,L., Carlo, W., A., Chakraborty, H. & Harrison, H. 2008. Effect of WHO Newborn Care Training on Maternal Mortality by Education. Ambul paediatric: 8(s) 300-4

Costello, A., M., L. & Manandhar, D.,S. 1994. Perinatal asphyxia in less developed countries. Arch. Dis. Child. Fetal Neonatal Ed.; 71:F1–F3.

Couper, I.,D., Thurley, J.,D., Hugo J., F. 2005. The neonatal resuscitation training project in Rural south Africa, Rural and remote health; 5: 459

Darmstadt, G., L., Bhutta, Z., A., Cousens, S., Adam, T., Walker, N. & de Bernis, L. 2005. Evidence-based, cost-effective interventions: how many newborn babies can we save? Lancet, 365:977-988.

Deorari, A., K., Paul, V., K., Singh, M. & Vidyasagar, D. 1997. Impact of education and training on neonatal resuscitation practices in 14 teaching hospitals in India. *Singapore Med J*, **38**(11)**:**485-487.

Deorari, A., K, Paul, V., K., Singh, M. & Vidyasagar, D. 2001. Impact of education and training on neonatal resuscitation practices in 14 teaching hospitals in India. *Ann Trop Paediatr*, **21**(1)**:**29-33.

English, M., Esamai, F., Wasunna, A., Were, F., Ogutu, B., Wamae, A., Snow, R.W. & Peshu, N., 2004. Delivery of paediatric care at the first-referral level in Kenya. *Lancet.*, 364:1622–1629.

Enweronu – Laryea, C., Engmann, C., Osafa, A., Bose, C. 2009. Evaluating the effectiveness of a strategy for teaching neonatal resuscitation in West Africa.Resuscitation, 80:1308-1311.

Ezenduka P. O., Ndie E. C., Oburoh E. T. 2015. Assessment of knowledge, attitude, and practice of nursing management of birth asphyxia in federal medical centre Asaba, Delta State-Nigeria. Clinical nursing studies, DOI: 10.5430/cns.v4n2p21.

Erika M. E., Rodger F. S., Karla f., Kate A. M., Gautham S., Joanna C and Jeffrey D.H. 2015. Identifying improvements for delivery room resuscitation management: results from a multicenter safety audit. Maternal health, neonatalogy and perinatology (2015)1:2 Doi 10.1186/540748 – D14-0006-x.

Faiza, A., Nasor, T., 2013. Assessment of knowledge attitude and practice of nurse midwives towards care of newborn in Khartoum state teaching hospital (2011).j.Am Sci, 9(9): 263-270). (ISSN 1545 – 1003).http://www.jofamericanscience.org.34.

Fishbein, M. 2008. A Reasoned Action Approach to Health Promotion, Medical Decision Making, 28, 834-844.

Fraser, W., D., Hofmeyr, J., Lede, R., Faron, G., Alexander, S., Goffinet, F., Ohlsson, A., Goulet, C., Turcot-Lemay, L., Prendiville, W., Marcoux, S., Laperriere, L., Roy, C., Petrou, S., Xu, H., R &Wei, B. 2005. Amnioinfusion for the prevention of the meconium aspiration syndrome. N. Engl. J. Med. 353:909–917.

Gebreegziabher, E., Adugna A. and Habtamu G. 2014. Knowledge and skills of neonatal resuscitation of health professionals at a University teaching hospital of North west Ethiopia. World J Emerg Med. 45 (3);196-202

General Nursing Council. 2010. Procedure Manual for Student Midwives. General Nursing Council, Lusaka, Zambia.

Gill, A. and Colvin J. 2007. Use of naloxone during neonatal resuscitation in Australia: compliance with the published guidelines.journal of paediatric and child health 43, 795-798

Haile-mariam A.,Tesfaye N.,,Chemess C., Barley P.,E. 2012. Assessing the healthealth system's capacity to conduct neonatal resuscitation in Ethiopia.Ethiop Med.jon.50©:46-56

Harvey, S., A., Blandon Y., C, Caw-Binns, A., SandinoI, Urbina, L., Rodriguez, C, et al. 2007. Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward of medical doctors and midwives' attitude towards neonatal resuscitation procedure. Bull World Health Organisation, 85 (10):783–90.

Henderson, C. & Macdonald, S. 2004**.** Mayes' Midwifery A Textbook for Midwives, 13th Edition, Elsevier Limited, London.

Horny, A.S. 2006. Oxford advanced learner's dictionary, 7th Edition, Oxford University Press, India.

Hole, K., M., H, Olmsted, K., Kiromera, A & Chamberlain, L. 2012. A Neonatal Resuscitation Curriculum in Malawi, Africa: Did It Change In-Hospital Mortality? Journal of Peadiatrics, Article ID 408689, 8 pages doi:10.1155/2012/408689

Jabir, M., M., Dougluoni, N., Fadhil, T., Zanardo, V. & Trevisanuto, D. 2009. Knowledge and Practical Performance gained by Iraqi Residents after Participation to a Neonatal Resuscitating Program Course. Acta. Peadiatrics 98:1265-1268 doi: 10.1111/j.1651-2227.01341.x.

Kaczorowski, J., Levitt, C., Hammond, M, Outerbridge, E., Grad, R., Rothman, A. et al. Retention of neonatal resuscitation skills and knowledge: a randomized

Kamenir, S., A. 1997. Neonatal resuscitation and newborn outcomes in rural Kenya. Journal of Tropical Peadiatrics, 43:170–173.

Kattwinkel, J., Niemeyer, S., Nadkarni, V, Tibballs, J., Phillips, B., Zideman, D. et al. 1999. Resuscitation of the newly born infant: an advisory statement from the Peadiatrics Working Group of the International Liaison Committee on Resuscitation. Resuscitation Feb; 40(2):71–88.

Kattwinkel,J. 2005. Textbook of neonatal resuscitation, 5th Edition, American Academy of Paediatrics, EIK Grove Village, IL.

Kattwinkel, J., Periman, J.M., Aziz K. et al. Par 15: Neonatal resuscitation: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation. 122 (18 suppl 3):5909 – 5919.

Keenan, W., J. 2004. Recommendations for management of the child born through meconium-stained amniotic fluid. Peadiatrics.; 113:133–134.

Khan, K., Pattison, T. 2011. Sherwood, M. Simulation in medical education. Med Teach. 33:1–3.

Kim, M.Y., Ansari, N., Kols, A., Tappis, H., Currie, S., Zainullah, P et al. 2013. Assessing the capacity for newborn resuscitation and factors associated with provider's knowledge and skills: a cross sectional study in Afghanistan. BMC Pediatrics. 13:40.

Koneti, 2016, http://www.answers.com/Q/What_are_the_properties_of_an_algorithm Date, 12th December, 2016, Time, 10 30 hrs.

Lee-Anne, C., C.**,** Cousens, S., Wall**, N., S.,** Niermeyer**, S.,** Gary, L., Darmstadt**, L., G.,** Carlo**, A., W.,** Keenan**, J., W.,** Bhutta**, A., Z.,** Gill, C **&** Lawn, E., J. 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. Bio Medical Centre of Public Health,11(Suppl):S12 doi: 10.1186/1471-2458-11-S3-S12.

Lawn, J., Shibuya, K. & Stein, C. 2005. No cry at birth: global estimates of intrapartum stillbirths and intrapartum-related neonatal deaths. *Lancet*, **365**(9462)**:** 891-900.

Lawn, J.,E., Cousens, S. & Zupan, J. 2005. Lancet Neonatal Survival Steering Team 4 million neonatal deaths: when? Where? Why? Lancet; 365: 891–900.

Lawn, J., E., Lee, A., C., Kinney, M., Sibley, L., Carlo, W., A., Paul, V., K., Pattinson, R. & Darmstadt .G., L. 2009. Two million intrapartum-related stillbirths and neonatal deaths: where, why, and what can be done? International Journal of Gynaecology and Obstetrics*, **107**(Suppl 1)**:**S5-18-S19.*

Louis, D., Kumar, P., Gupta, A. 2013. Knowledge and practices of healthcare providers about essential newborn care and resuscitation in a district of Haryana.J Indian Med Assoc. feb; 111(2):114-7.

Lowdermilk, D., L., & Perry, T.E., 2006. Maternity Nursing, 7th Edition, Mosby Inc., Canada Margaret, Rouse (2010), searchdata. Management. techtarget.com/definition/compliance.

Melanie, P., M^{c} Graw, M.,D., Jersey, M., Periman, M.,B. Attitude of neonatologists towards delivery room management of confirmed trisomy 18: potential factors influencing a changing dynamic. Pediatrics vol.12.No 6 June 1 2008. Pp 1106-1110

Murila, F., Madadi, O., Musoke, R., 2012. Assessment of knowledge on Neonatal resuscitation among health care providers in Kenya.Pan Afr Medj v.11;2012:11:78

Mutungi,A., Harvey, S., Kibaru, J., Lugina, H., Kinoti, S., Larissa, J., Thada, B., Hizza, E., 2008. Kenya: Assessment of health workforce competency and faculty readiness to provide quality maternity health services . Operations research results. Published for the United States Agency for International Development by quality assurance project. BethesdaMD: University Research Co., LLC(URC)

Msemo, G., Massawa, A., Mbando, D., Rusibanayila, N., Manji, K., Kidantu, H.l., Mwizamuholya, D., Ringia, P., Ersdal, H.L., Perlman, J. Newborn mortality and fresh still birth rates in Tanzania after helping babies breathe training. Pediatrics.2013 131(2): e 353 – e 360.10.(542/paeds.2012.795.

Niermeyer, S., Kattwinkel, J., van Reempts, P., Nadkarni, V., Phillips, B., Zideman, D., Azzopardi, D., Berg, R., Boyle, D., Boyle, R., Burchfield, D., Carlo, W., Chameides, L., Denson, S., Fallat, M., Gerardi, M., Gunn, A., Hazinski, M.F., Keenan, W., Knaebel, S., Milner, A., Perlman, J., Saugstad, O.D., Schleien, C., Solimano, A., Speer, M., Toce, S., Wiswell, T.& Zaritsky, 2000. A. International Guidelines for Neonatal Resuscitation: an excerpt from the Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care: International Consensus on Science. Contributors and Reviewers for the Neonatal Resuscitation Guidelines. Peadiatrics. 106:E29.

Ogunlesi, A.T., Dedeke, I.O., Adekanmbi A.F., Fetuga, M.B., Okeniyi, J.A. 2008. Neonatal resuscitation: knowledge and practice of nurses in western Nigeria. SAJCH, 2:23–25.

Opiyo, N., English, M. 2006. Newborn resuscitation: defining best practices for low income settings. Trans R Soc Trop Med Hyg. oct, 100(10 – 4) 899 – 908.

Patel, J., Posencheg, M. and Ades, A. 2001. Effects of state wide neonatal resuscitation training program on Apgar score among high risk neonate in Illinois. Paediatrics. Apr;107(4):648-55.

Pattinson R., Woods, D., Greenfield, D., Velaphi, S. 2005. Improving survival rates of newborn infants in South Africa. Reproductive Health. 2:4.

Polit, D., F & Hungler, B., P. (1997). Essentials of Nursing Research, Methods, Appraisal and Utilization. Lippincott, Philadelphia.

Polit, D., F., Beck, C., T and Hungler, B., P. 2001. Essentials of Nursing Research, Methods, Appraisal and Utilization. Lippincott, Philadelphia

Ramji, S., Rasaily, R., Mishra. P.K. et al. 2003. Resuscitation of asphyxiated newborn with room air or 100% at birth: multicentric clinical trial. Indian pediatr.40 (6):510-517

Robin, L., B. 2011. Neonatal resuscitation; Medscape Reference, Updated November 4, 2011.

Sibiya, M., N. and Sibiya, N., E. 2014. Work integrated learning experience of primary health post basic nursing students in clinical setting, a university technology context. Journal of higher education, vol. 28; 1943 – 1958.

Shriver, K., E. 2011. National Institute of Child Health and Human Development: saving infants lives around the world, March.

Taksande, M.A., Vilhekar, K.,Y. 2012. Neonatal resuscitation training programme, its efficiency at rural hospital.Medical Journal of Islamic World Academy of Sciences. ;20:6–9.

Trevisanunuto, D., Ibrahim, A.S., Doglioni, N., Salvadoni, S., Ferrarese, P., Zanardo, V. 2007. Neonatal resuscitation courses for pediatrics residents: comparison between Khartoum (Sudan) and Padowa (Italy) Paediatr Anaesth. 17:28–31

Van den broek N., Graham, W. 2009. Quality of care for maternal and new born health: the neglected agenda. BjoG.2009, 116(suppl.1):18 – 21.10.1111/j.1471-0528.02333.

World Health Organization (WHO). 2005. The World Health Report 2005 - make every mother and child count. *Geneva,* Switzerland.

World Health Organization (WHO). 1997. Safe motherhood unit, Basic Newborn Resuscitation- a practical guide, Geneva, Switzerland.

WHO, 1997, Basic Newborn Resuscitation - a practical guide, Geneva. Switzerland.

World Health Organisation 2009. Basic Neonatal Resuscitation program: a practical guide. WHO. Geneva

World Health Organisation (WHO) 2010 International consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. Part 11: Neonatal resuscitation: Circulation, 2010, 122(Suppl. 2):S516 –S538.

World Health Organisation (WHO) 2012. Guidelines on basic neonatal resuscitation, Geneva, Switzerland.

Young, M., K., Nasratullah, A., Adrienne, K., Hannah,T., Sheena, C., Partamin, Z., Kai, S., Los, V., R., Barley, P., G., Richard, S. and Kai, S. 2013. Neonatal resuscitation skills training program in Columbia: its impact on the health care professionals' competency in newborn resuscitation reproductive and child health. Kim et al. BMC Pediatrics, 13:140

Young, M., K., Nasratullah, A., Adrienne, K., Hannah,T., Sheena, C., Partamin, Z., Kai, S., Los, V., R., Barley, P., G., Richard, S. and Kai, S. 2013. Assessing the capacity for newborn resuscitation and factors associated with providers' knowledge and skills: a cross-sectional study in Afghanistan.BMC. Pediatrics201313:140 Doi:1186/1471-2431-13-140.

Zhu, X., Y., Fang, H., Q., Zeng, S., P., Li, Y., M. & Shi, S., Z. 1997. The impact of the Neonatal Resuscitation Program Guidelines (NRPG) on the neonatal mortality in a hospital in Zhuhai, China. Singapore Medical Journal, November; 38(11):485-7

APPENDICES

APPENDIX 1

CLIENT INFORMATION SHEET

STUDY TITTLE

Compliance with the World Health Organisation neonatal resuscitation guidelines by Medical Doctors and Midwives in Kitwe District Health Facilities, Zambia.

INTRODUCTION

I, Juliet Kasanga Munganga, a student of Masters of Science in Nursing in the Department of Nursing Science at the University of Zambia is kindly requesting for your participation in the above mentioned research study because it is important to assess compliance to neonatal resuscitation. Before you decide whether or not to participate in this study, I would like to explain to you the purpose of the study, any risks to you and what is expected for you. Your participation in this study is entirely voluntary. You are under no obligation to participate; you may choose to participate or not to participate. If you decline to participate, no privileges will be taken away from you as an employee in Kitwe district health facilities. If you agree to participate, you will be asked to sign this informed consent form in front of someone.

PURPOSE OF THE STUDY

The study will assist to obtain more information on compliance of medical doctors and midwives with neonatal resuscitation working in Kitwe district health facilities. The data from this study will assist health care managers to find ways and means of improving compliance with neonatal resuscitation thereby reducing neonatal morbidity, disability and mortality.

PROCEDURE

As participant in the study you will be expected to fill in a questionnaire which will take about 20 to 30 minutes to complete. You will be expected to tick or give short answers to some of the questions in the questionnaire. All questionnaires will have a code attached during the study to ensure confidentiality. To confirm your acceptance to participate, you will be given a consent form to sign. No names or any form of identifying information will be obtained on the questionnaire.

RISKS AND DISCOMFORT

No risks or discomforts are involved apart from the use of your time in answering questions and the presence of the observer. Answering questions will take approximately 30 minutes.

BENEFITS

By taking part in this study, you will be able to provide information that will help relevant authorities and policy makers to come up with strategies and policies that will help to improve compliance with neonatal resuscitation practices by midwives and doctors. This will in turn reduce neonatal death occurring in the health facilities. No monetary favours will be given in exchange for information obtained, but the information on recommended best practices will be give on any aspect of neonatal resuscitation.

CONFIDENTIALITY

Your research records and any information you will give will be confidential to the extent permitted by law. You will be identified by code and personal information will not be released without your written permission, except when required by law.

PARTICIPATION

Your participation in this study is personal and voluntary. You are not under obligation to participate. You are at liberty to refuse participation and are free to withdraw. If you decline to participate, no privileges will be taken away from you. If you agree to participate, you will be asked to sign a consent form in the presence of a witness.

Any complaints will be treated in confidence and fully investigated. The participant will be informed of the outcome.

Thank you for taking time to read the information sheet.

Your willingness to participate in this study is greatly appreciated.

PERSONS TO CONTACT FOR PROBLEMS OR QUESTIONS

The Head of Department
University of Zambia
School of Medicine,
Department of Nursing Sciences,
P.O. Box 50110,
Lusaka.
Telephone No. 211252453

The Chairperson,
Biomedical Research Ethics Committee,
School of Medicine,
P.O. Box 50110,
Lusaka
Telephone No. 211256067

APPENDIX 2

CONSENT FORM

I have been fully informed of the purpose of the study. The benefits, discomforts, risks and confidentiality and I agree to participate willingly. I further understand that, if I take part in this study, I can withdraw at any time without having to give an explanation and taking part in this study is purely voluntary.

I ……..Names)

Agree to take part in the answering the questionnaire and in the observation.

Signed/thumb …… Date…….. (Participant)

Signed/thumb ……Date…… (Witness)

PERSONS TO CONTACT FOR PROBLEMS OR QUESTIONS

The Head of Department
University of Zambia
School of Medicine,
Department of Nursing Sciences,
P.O. Box 50110,
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SELF ADMINISTERED QUESTIONNAIRE

SCHOOL OF MEDICINE

DEPARTMENT OF NURSING SCIENCES

SELF ADMINISTERED QUESTIONNAIRE

COMPLIANCE WITH WORLD HEALTH ORGANISATION NEONATAL RESUSCITATION STANDRADS BY MEDICAL DOCTORS AND MIDWIVES IN KITWE DISTRICT HEALTH FACILITIES

DATE:…….

PLACE…….

SERIAL NUMBER:……

INSTRUCTIONS TO THE RESPONDENTS

1. Do not write your name on this interview schedule
2. Tick the most appropriate response to the question or fill in the answers on provided space
3. All information obtained will be kept in confidence

SECTION A: **DEMOGRAPHIC DATA**

1. Sex [ ]

   1. Male ☐
   2. Female ☐

2. Marital status [ ]

   1. Married ☐
   2. Single ☐
   3. Widowed ☐
   4. Divorced ☐

   5 others specify……

3. Age in years [ ]

   1. 20 – 30 yrs ☐
   2. 31 – 40 yrs ☐
   3. 41 – 50 yrs ☐
   4. 51 – 60 yrs ☐
   5. 61 and above ☐

4. Health profession [ ]

   1. Registered midwife ☐
   2. Enrolled midwife ☐
   3. Certified midwife ☐
   4. Obstetrician ☐
   5. Medical doctor ☐

5. Years of experience [ ]

1. 0 – 5years ☐
2. 6 – 10 years ☐
3. 11 – 15 years ☐
4. 16 – 20 years ☐
5. above 20 yrs ☐

6. Health facility [ ]

1. Hospital labour ward ☐
2. Health centre labour ward ☐
3. Special baby care unit ☐

SECTION B: KNOWLEDGE ABOUT NEONATAL RESUSCITATION

7. Have you ever heard of neonatal resuscitation? [ ]

1. Yes ☐
2. No ☐

8. If yes, where did you hear of neonatal resuscitation? [ ]

1. University /school of medicine ☐
2. Midwifery school / college ☐
3. On internet ☐
4. Others specify……

9. Is it necessary to test endotracheal tube and ambu bag before use? [ ]

1. Yes ☐
2. No ☐

10. If yes, state the reason……

……..

……..……

11. How much oxygen saturation should be given to the neonate at one minute Apgar score during resuscitation? [ ]

1. 90 – 100% ☐
2. 80 – 90% ☐
3. 70 – 80 % ☐
4. 60 – 70% ☐

12. When is ventilation confirmed to be effective? [ ]

1. Heart rate increasing to 100 beats/minute or more ☐
2. Slight rise of the chest and upper abdomen with each inflation ☐
3. Improving oxygenation ☐

13. Is neonatal resuscitation a vital procedure in labour ward?

1. Yes ☐ [ ]
2. No ☐

14. If your answer to 13 is No, explain the reasons why neonatal resuscitation is not vital in your opinion [ ]

……

……

……

……

……

15 Mention three (3) ways in which positive pressure ventilation can be delivered to neonate [ ]

1. ……

2. ……

3……..

16. List the principles of Neonatal resuscitation [ ]

1……

2……..

3…….....

17. Is there a relationship between the neonatal resuscitation and the Apgar score? [ ]

1. Yes ☐

2. No ☐

18. If yes, what is the connection? ……. [ ]

……

……

……

……

SECTION C: ATTITUDE TOWARDS NEONATAL RESUSCITATION

19. Is neonatal resuscitation beneficial to a neonate? [ ]

1. Strongly agree ☐
2. Agree ☐
3. Disagree ☐
4. Strongly disagree ☐
5. Uncertain ☐

20. Health professionals (Doctors and Midwives) must use the neonatal resuscitation guidelines when resuscitating every neonate [ ]

1. Strongly agree ☐
2. Agree ☐
3. Disagree ☐
4. Strongly disagree ☐
4. Uncertain ☐

21. Were you adequately prepared to conduct neonatal resuscitation Steps? [ ]

1. Strongly agree ☐
2. Agree ☐
3. Uncertain ☐
4. Disagree ☐
5. Strongly disagree ☐

22. Should doctors and midwives use neonatal resuscitation guideline every time they resuscitate a neonate? [ ]

1. Strongly agree ☐
2. Agree ☐
3. Strongly disagree ☐
4. Disagree ☐
5. Uncertain ☐

23. Do you feel that a neonate with gross malformations should be resuscitated? [ ]

1. Strongly agree ☐
2. Agree ☐
3. Disagree ☐
4. Strongly disagree ☐
5. Uncertain ☐

24. Do you feel that resuscitation should be left for midwives only? [ ]

1. Strongly agree ☐
2. Agree ☐
3. Disagree ☐
4. Strongly disagree ☐
5. Uncertain ☐

25. If you strongly disagree, give reasons……. [ ]

……

……

SECTION D: IN HOUSE REFRESHER COURSES ON

NEONATAL RESUSCITATION

26. Have you ever received any additional training on neonatal resuscitation? [ ]

1. Yes ☐

2. No ☐

27. If your answer to question 24 is yes, mention the type of training you attended [ ]

……

28. How many in-house sensitising training did you attend in a year? [ ]

1. Three (3) ☐
2. Two (2) ☐
3. One (1) ☐
4. None (0) ☐

SECTION E: AVAILABILITY OF NEONATAL RESUSCITATION

EQUIPMENT

29. Please score the availability of equipment for neonatal resuscitation in your ward/centre [ ]

1. Always available ☐
2. Occasionally available ☐
3. Not available ☐

30. Neonatal resuscitation equipment influence the care given to the neonate during resuscitation [ ]

1. Strongly agree ☐
2. Agree ☐
3. Uncertain ☐
4. Disagree ☐
5. Strongly disagree ☐

31. It is easy to access/ obtain resuscitation equipment in your Ward/centre [ ]

1. Easily accessible ☐
2. Not easily accessible ☐

32. You have ever seen an ideal resuscitaire in your institution? [ ]

1. Yes ☐
2. No ☐

SECTION F: COMPLIANCE WITH NEONATAL RESUSCITATION

33. How often do you refer to the guidelines during neonatal resuscitation? [ ]

1. All the times ☐
2. Most of the times ☐
3. Sometimes ☐
4. Rarely ☐

34. Did the health worker use a suction machine to resuscitate the baby? [ ]

1. Yes ☐
2. No ☐

35. What do you use to resuscitate the baby [ ]

1. Suction machine ☐
2. Neonatal ambu bag ☐
3. Methylated spirit ☐
4. Oxygen ☐
5. Others specify…….....

36. What motivates you to follow the guidelines on resuscitation [ ]

1. The presence of the guidelines on the wall ☐
2. The present of the supervisor ☐
3. The simplicity of the guidelines ☐
4. Others specify…….....

37. Do you think the staffing levels have a bearing on the use of resuscitation guidelines? [ ]

1. Yes ☐
2. No ☐

38. Give reasons to your answer in question 37 [ ]

……

……

……

39. What would make the doctor/midwife not to be able to use the neonatal resuscitation guidelines when resuscitating a newborn? [ ]

1. Lack of orientation on how to use the guidelines being used at the facility ☐
2. Mastery knowledge by the health providers ☐
3. Lack of commitment ☐
4. Lack of supervision ☐
5. Others specify……

……..

……..

40. Do you have problems in using the guidelines for neonatal resuscitation? [ ]

1. Yes ☐
2. No ☐

41. If the answer to question 40 is yes, specify the problem [ ]

……

……

42. Do you have a team leader for neonatal resuscitation? [ ]

1. Yes ☐
2. No. ☐

43. If the answer to question 42 is yes, is the team leader available when resuscitating every neonate in your facility? [ ]

1. Yes ☐
2. No ☐

44. What suggestions would you make in order to improve use on the neonatal resuscitation guidelines by doctors and midwives in your health facility [ ]

……

……

……

……

THANK YOU FOR YOUR PARTICIPATION

APPENDIX 4: MARKING KEY FOR THE STUDY VARIABLES

SECTION B. KNOWLEDGE OF NEONATAL RESUSCITATION			
QUESTION NUMBER	**QUESTION**	**CORRECT ANSWER**	**MAXIMUM SCORE**
7	Have you ever heard of neonatal resuscitation?	**Yes**	**1**
8	If yes, where did you hear of neonatal resuscitation?	-School of medicine -midwifery school	**2**
9	Is it necessary to test endotracheal tube and ambu bag before use?	**Yes**	**1**
10	If yes, state the reasons	**-**To ensure there are in good working condition -To prevent panicking and wasting time	**2**
11.	How much oxygen should be given to the neonate at one minute Apgar score during resuscitation?	**60 – 70%**	**1**
12	When is ventilation confirmed to be effective?	1. Heart rate increasing to 100 per/minute or more 2. Slight rise of the chest and upper abdomen with each inflation 3. improving oxygenation	**3**
13	Is neonatal resuscitation a vital	yes	**1**

	procedure in labour ward?		
14	. If your answer to 13 is No, explain the reasons why neonatal resuscitation is not vital in your opinion	It contributes to brain damage	**1**
15	Mention three (3) ways in which positive pressure ventilation can be delivered to neonate	1. Face ask 2. Endotracheal tube 3. Laryngeal mask	**3**
16	List the principles of Neonatal resuscitation	- airway - breathing - circulation	**3**
17	Is there a relationship between the neonatal resuscitation and the Apgar score?	Yes	**1**
18	If yes, what is the connection?	It's useful in identifying neonates that require resuscitation at birth	1
SECTION C: ATTITUDE			
19	Is neonatal resuscitation beneficial to a neonate?	Strongly agree	**1**
20.	Health professionals (Doctors and Midwives) must use	Strongly agree	**1**

	the neonatal resuscitation guidelines when resuscitating every neonate		
21.	Were you adequately prepared to conduct neonatal resuscitation steps?	Strongly agree	**1**
22.	Should doctors and midwives use neonatal resuscitation guideline every time they resuscitate a baby?	Strongly agree	**1**
23	Do you feel that a neonate with gross malformations should be resuscitated?	Strongly agree	**1**
24	Do you feel that resuscitation should be left for midwives only?	Strongly agree	**1**
25	if you strongly disagree, give reasons	All the doctors and midwives have been trained to conduct neonatal resuscitation	**1**
SECTION D: IN HOUSE REFRESHER COURSES ON NEONATAL RESUCITATION			
26.	Since you started	Yes	**1**

	work at this facility, have you ever received any additional training on neonatal resuscitation?		
27.	If your answer to question 24 is yes, mention the type of training you attended	EmONC HBB	**1**
28	How many in-house sensitising training do you usually have as a department in a year?	Two	**1**
SECTION E: AVAILABILITY OF NEONATAL RESUSCITATION EQUIPMENT			
29.	Please score the availability of equipment for neonatal resuscitation	Always available	**1**
30.	Neonatal resuscitation equipment influence the care given to the neonate during resuscitation	Strongly agree	**1**
31.	How easy is it to access/ obtain resuscitation equipment in your	Easily accessible	**1**

	department?		
32.	Have ever you seen an ideal resuscitation in your institution?	Yes	**1**
SECTION F : COMPLIANCE WITH NEONATAL RESUSCITATION			
33.	How often do you refer to the guidelines during neonatal resuscitation?	All the times	**1**
34.	Did the health work use suction machine to resuscitate the baby	yes	**1**
35	What do you use to resuscitate the baby	Suction machine Neonatal ambu bag oxygen	**2**
36.	What motivates you to follow the guidelines on resuscitation	-The presence of the guidelines on the wall - The present of the supervisor -The simplicity of the guidelines	**3**
37.	Do you think the staffing levels have a bearing on the use of resuscitation guidelines?	**Yes**	**1**

38.	Give reasons to your answer in question 31	-Good staffing levels will proper midwife: patient ratios. -Midwives will not be rushing to do the procedure in order to attend to other patients. -Midwives/doctors will avoid short cuts	**3**
39.	What would make the doctor/midwife not to be able to use the neonatal resuscitation guidelines when resuscitating a newborn?	-Lack of equipment -Inadequate medical and surgical supplies - poor staffing levels -inadequate knowledge - lack of skill	**5**
40.	Do you have problems in using the guidelines for neonatal resuscitation?	**Yes**	**1**
41.	if the answer to question 34 is yes, specify the problem	**-**Too long -It is time consuming - it delays the who procedure	**3**
42.	Do you have a team leader for neonatal resuscitation?	Yes	**1**
43.	If the answer to question 36 is yes, is the team leader	Yes	**1**

	available when resuscitating every neonate in your facility?		
44.	What suggestions would you make in order to encourage the use of neonatal resuscitation guidelines by doctors and midwives in your health facility	- procure equipment for resuscitation -train all the doctors and midwives in HBB and EmONC -stick all protocols at the site for resuscitation	**3**
45	What are some of the factors that affect compliance with WHO neonatal resuscitation standards in your institution?	- Shortage of staff - Inadequate equipment - Inadequate supervision - Lack of refresher courses	**4**
TOTAL			**62**

APPENDIX 5: PARTICIPANT INFORMATION AND CONSENT FORM

PARTICIPANT SERIAL NUMBER: ……

My name is Juliet kasanga munganga, a student at the University of Zambia, school of medicine, and department of nursing science. **I am conducting a study entitled; compliance with the World Health Organisation neonatal resuscitation guidelines by medical doctors and midwives in Kitwe district health facilities, Zambia.**

This study involves observation of the medical doctors and midwives conducting the basic resuscitation procedure of neonate in the delivery facility.

Participation is completely voluntary. You have the right to say no. if you have concerns about this study feel free to ask the researcher.

Indicate your voluntary agreement to participate by signing below will mean that you voluntarily agreed to participate in this study.

……

…….

Signature Date

APPENDIX 6: CHECKLIST

SCHOOL OF MEDICINE

DEPARTMENT OF NURSING SCIENCE

OBSERVATION CHECKLIST

TOPIC: COMPLIANCE WITH WORLD HEALTH ORGANISATION NEONATAL RESUSCITATION GUIDELINES BY MEDICAL DOCTORS AND MIDWIVES IN KITWE DISTRICT HEALTH FACILITIES

DATE…….. SERIAL NO…….

INSTRUCTIONS FOR THE OBSERVERS

1. Introduce yourself and explain the reason for the observation
2. Do not write the name of the participant on the observation checklist
3. Ask the participant to act as normally as possible during the observation
4. Assure the participants that no one is being evaluated and that no one's actions will be identified with them as individuals
5. All the observation notes should be kept in strict confidence
6. Thank the participant at the end of each observation

NO	STEPS	SCORES	
		NO (0)	YES (1)
A.	**ASSESSMENT**		
1.	Did the health provider lists necessary equipment and supplies (in any order) and test for functioning of the equipment :		
2	Did the health provider warm the room; turn on heating lamp, if available.		
3	Did the health provider washes and dries hands, puts on gloves (if available).		
4	Did the health provider dry and stimulate the baby by rubbing him from head to toe with a cloth or towel, especially up and down the spine.		
5	Did the health provider discard the wet cloth used to dry the baby and quickly wrap the neonate loosely with a dry cloth.		
6	Did the health provider look at the neonate to see if he/she is breathing or crying.		
7	Did the health provider decide that the neonate needs resuscitation.		
8	Did the health provider tells the mother briefly that the baby needs special care to start breathing		
9	Did the health provider call for help, act fast and begin resuscitation immediately		
10	Did the health provider note the time clamp (or tie) and cut the cord quickly, leaving a cord stump at least 10 cm long.		
B	**BREATHING**		
11	Did the health provider wipe the baby's face quickly with a		

	clean gauze square or cloth		
12	Did the health provider use a bulb syringe or penguin sucker, suctions first the baby's mouth, then the nose.		
13	Did the health provider suction only while pulling out the catheter or bulb syringe.		
14	Did the health provider suctions no deeper than 5 cm in the mouth or 3 cm in the nose.		
15	Did the health provider look at the neonate's breathing to reassess him.		
16	Did the health provider look for gasping, breathing less than 30 breaths per minute, or absence of breathing.		
17	Did the health provider, act quickly to begin ventilation upon realising that the neonate is breathing less than 30 breaths per minute.		
18	Bag-and-mask ventilation: did the health provider cover the nose and mouth with the proper size mask for the neonate's size.		
19	Did the health provider use one hand to hold the mask firmly to the face with the neck slightly extended		
20	Did the health provider use the other hand to squeeze the bag.		
21	Did the health provider check the neonate's position, repositions mouth or mask, and tries again upon realising that the chest does not rise with one breath		
22	Did the health provider keep on re-adjusting until getting the chest to rise with each breath? If necessary, repeats suctioning.		
23	Did the health provider ventilate the neonate 40 times in one minute?		
24	After one minute of ventilation, did the health provider stop and watch to reassess if neonate is breathing adequately on his own.		

25	Continue ventilating and observing until the baby's breathing is normal.		
26	NO BREATHING OBSERVED , does the health provider take the following steps: • If the baby has not made any attempt to breathe, stop Resuscitation effort after 20 minutes • Washes hands with soap and water and dries them on a clean towel, or air dries them. • Talk to the parents about the baby's problem and the resuscitation. Listen to them and answer their questions.		
27	After successful resuscitation • Did the health provider give the baby to the mother for skin-to-skin warming and breastfeeding as soon as possible. • Did the health provider keep the baby warm and dry. Defer the first bath for at least 6 hours after the baby is stable.		
C	**OXYGEN ADMINISTRATION**		
28	if breathing difficulty is detected: • Does the health provider give oxygen to the neonate at the correct rate per minute in accordance to the gestation age. • Does the health provide stimulate the baby to continue breathing by rubbing hand up and down the spine		
29	if the neonate's condition deteriorates: • Does the health provider transfer quickly to neonatal care unit for advanced resuscitation procedure • Does the health provider write down what was done during resuscitation and how long the resuscitation		

	took.		
30	Post resuscitation procedure : • Does the health provider disconnect the tubings and process them to prevent infection • Does the health provider wash hands and dry them • Does the health provider thanks the mother for the cooperation		
	TOTAL POINTS		**36**

APPENDIX 7:

DELIVERY ROOM CHECKLIST

a) Equipment and medical/surgical supplies

S/N	ITEM	PRESENT (+) ABSENT (-)	COMMENT
1	Neonatal resuscitator		
2	Suction machine/ penguin sucker		
3	face masks(suitable for preterm and term neonates)		
4	Oxygen cylinder		
5	Umbilical catheterisation kit		
6	Suction tubing (all sizes)		
7	Pulse oximeter		
8	Clock with timer		
9	Endotracheal tubes (ETT) (uncuffed, no eye, sizes 2.5, 3.0, 3.5 and 4.0 mm internal diameter)		
10	Laryngoscopes with neonatal blades (sizes 00,0 and 1)		
10	Spare batteries and bulbs compatible with laryngoscope handles and blades		
12	Overhead heaters(any improvised heating system)		
13	Gloves – clean - sterile		
14	Syringes & needles		
15	Cotton swabs		

16	Gause swabs		
17	Resuscitation drugs – adrenaline and 50% dextrose		
18	Hand washing bay with soap		
19	Decontamination basin for tubings		
20	Intravenous cannula- 24G		
21	scalp vein cannula		
22	Skin preparation solutions suitable for neonates		
23	Resuscitation record sheet		
24	Intravenous fluids – normal saline		
25	Tapes and devices to secure canula		
26	Warm towel or similar covering		
27	Light for the area		

b) PROTOCALS AND GUIDELINES

S/N	ITEM	PRESENT (+) ABSENT (-)	COMMENT
1	Apgar scoring chart		
2	Neonatal resuscitation guidelines/ flow charts		
3	Management of hypothermia		
4	Procedure manual		
5	Resuscitation equipment checklist		
6	Resuscitation record sheet		

APPENDIX 8

Research Budget

SN	BUDGET CATEGORY	UNIT COST (ZMK)	QUANTITY	TOTAL
1	STATIONARY			
	(a) Bond paper	30	10	300
	(b) Pens	1.50	10	15
	(c) Pencils	1	5	5
	(d) Rubbers	1	5	5
	(e) Note book	10	2	20
	(f) Tippex	10	1	10
	(g) Stapler	20	1	20
	(h) Staples	10	1	10
	(i) Scientific calculator	100	1	100
	(j) Bag for interview schedules	30	3	90
	(k) Flash disk	20	1	20
	(l) CD-RW	10	2	20
	Subtotal			615
2	PERSONNEL			
	(a) Lunch allowance (Researcher + 2 assistants)	50	3 x 30 days	4,500
	(b) local transport charges within Kitwe (researcher + 2 assistants)	50	3x 30 days	4,500
	Subtotal			9,000
3.	TYPING SERVICES			
	(a) Proposal binding		4 copies	80

	(b) Formatting proposal and report	20	1 copy 1	150 1500
	(c) Poster presentation	150	1	500
	(d) Software package	1500	1	1000
	(e) Data entry and analysis	500	1	500
	(f) Ethics committee fee	1000	100 x5	1500
	(g) Printing research report	500	copies	
		3	5	1000
	(h) Binding research report	200		
	Subtotal			6,230
	TOTAL			15,845
	CONTINGENCY 10%			1,584.50
	GRAND TOTAL			17,429.50

JUSTIFICATION FOR THE BUDGET

a) STATIONARY

The stationary was required to type proposal, the 86 questionnaires and 20 observation checklists, research report and other accompanying documents. The pencils, pens and the note book were required for recording all the data that was obtained during the pilot and the main study. The staples and stapler were used to secure the individual pages of the self-administered questionnaire and observation checklist in the order of importance for easy use by health providers. For the purpose of data analysis a scientific calculator was required. The tippex was used erase data that was not required or where errors were made by the respondents as they were writing their data on the questionnaire. The CD-RW and the flask disc were used as a backup for the research proposal and report.

PERSONNEL

The funds for transport, lunch of the investigator and the two research assistants enabled movements to and from the identified health centres and the hospital within Kitwe district for the data collection and pilot study data correction for the total period of thirty (30) days.

c) TYPING SERVICES

The figure allocated in the budget enabled the research to carry out the binding costs of the research proposal and the final research reports.

d) CONTIGENCY FUND

The contingency fund amounting to 10% of the total budget was required to cater for any variations and unforeseen expenditure during the whole research process.

APPENDIX 9:

TIME FRAME (GHANNT CHART)

			2015												2016					
S/N	TASSK TO BE PERFORMED	RESPONSIBLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	Literature review		→	→	→	→	→	→	→	→	→	→	→	→						
2	Finalising proposal		→	→	→	→	→	→	→	→	→									
3	Presentation to graduate studies									→	→									
4	Approval by REC										→	→	→	→	→					
5	Data collection										→	→	→	→						
6	Data analysis															→	→			
7	Report writing																→	→		
8	Submission of draft																		→	→

	report																		
9	Finalization of report																	→	
10	Dissemination of results																		→

THE UNIVERSITY OF ZAMBIA

BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: 260-1-256067
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44370
Fax: + 260-1-250753
E-mail: unzarec@unza.zm

Ridgeway Campus
P.O. Box 50110
Lusaka, Zambia

Assurance No. FWA00000338
IRB00001131 of IORG0000774

4th February, 2015.

Our Ref: 005-05-14.

Ms. Juliet K. Munganga,
University of Zambia,
School of medicine,
Department of Nursing Science,
P.O Box 50110,
Lusaka.

Dear Ms. Munganga,

RE: RESUBMITTED RESEARCH PROPOSAL: **"COMPLIANCE WITH WORLD HEALTH ORGANISATION NEONATAL RESUSCITATION GUIDELINES BY MEDICAL DOCTORS AND MIDWIVES IN KITWE DISTRICT HEALTH FACILITIES, ZAMBIA" (REF. No. 005-05-14)**

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 2nd February, 2015. The proposal is approved.

CONDITIONS:

- This approval is based strictly on your submitted proposal. Should there be need for you to modify or change the study design or methodology, you will need to seek clearance from the Research Ethics Committee.
- If you have need for further clarification please consult this office. Please note that it is mandatory that you submit a detailed progress report of your study to this Committee every six months and a final copy of your report at the end of the study.
- Any serious adverse events must be reported at once to this Committee.
- Please note that when your approval expires you may need to request for renewal. The request should be accompanied by a Progress Report (Progress Report Forms can be obtained from the Secretariat).
- **Ensure that a final copy of the results is submitted to this Committee.**

Yours sincerely,

M.M.Mbewe (mrs)
CHAIRPERSON

Date of approval: 4th February, 2015. **Date of expiry:** 3rd February, 2016.

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
COPPERBELT PROVINCIAL HEALTH OFFICE
P. O. BOX 70032, PWD YARD, KABOMPO ROAD, NDOLA
Tel: (260) 2 681274 Fax: (260)680953

18th September, 2013

THE UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
DEPARTMENT OF NURSING SCIENCES
P.O. BOX 50110
RIDGEWAY
LUSAKA.

Dear Madam,

RE: REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

I wish to acknowledge receipt of your letter dated 6th September, 2013 regarding the above subject matter.

I am pleased to inform you that the office has no objection to your request, however, permission to conduct this study will only be granted upon clearance of your research proposal by the Ethics Committee.

Wishing you success in your academic endeavour.

Yours faithfully

Dr. Lyapa Sikazwe

A/PROVINCIAL MEDICAL OFFICER – COPPERBELT

Allow Student's Study

MINISTRY OF HEALTH
KITWE DISTRICT HEALTH OFFICE
24 FEB 2015
SENIOR PLANNER
P.O.BOX 22491 KITWE
TELFAX: 02 222582

Ms Juliet Kasanga Munganga
University of Zambia
Department of Nursing Science
Box 50110
LUSAKA

11TH February, 2015

The District Medical Officer
Kitwe District Health Office
KITWE

Dear Sir,

REF: PERMISSION TO CONDUCT A RESEARCH STUDY

I am a student pursuing the second part of Master of Science in Nursing Degree at the University of Zambia. As part of the requirements of the programme, I am required to undertake a research project. The title of my dissertation is "**Compliance with World Health Organisation neonatal resuscitation guidelines by medical doctors and midwives in Kitwe district health facilities, Zambia".**

I wish to inform you the research proposal was presented to the Biomedical Research Ethics Committee and that it was approved on the 4th February, 2015. I am therefore seeking for permission to proceed with data collection.

Find attached a copy of approved by UNZA.

Thanking you in advance.

Yours faithfully,

Juliet Kasanga Munganga

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
KITWE CENTRAL HOSPITAL

Kuomboka Drive
P O Box 20969
Kitwe
Zambia

Telefax: 224365/228604
kchmoh@gmail.com

All Correspondence to Be Addressed to the Senior Medical Superintendent

Our Ref:
Your Re:

16th February, 2015

Mrs. Juliet Kasanga Munganga
University of Zambia
LUSAKA

Dear Mrs. Munganga

RE: APPLICATION TO CONDUCT A RESEARCH STUDY - YOURSELF

We refer to your letter dated 11th February, 2015 in which you requested to conduct a research study in Compliance with World Health Organisation Neonatal Resuscitation Guidelines by Medical Doctors and Midwives in Kitwe District Health Facilities, Zambia.

We are pleased to inform you that Authority has been granted for you to do your research.

We wish you all the best.

18 FEB 2015

Isaac Menyani (Mr.)
Ag/Senior Human Resource Management Officer
FOR/SENIOR MEDICAL SUPERINTENDENT