

**MEASURING COMPETENCE AMONG HEALTH
WORKERS IN CASE MANAGEMENT OF
MALARIA IN PREGNANCY IN RURAL ZAMBIA
(GWEMBE)**

By

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(BSc)

**A dissertation submitted to the University of Zambia in partial fulfillment of
the requirements of the degree of MPH (HPE&M)**

UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

DEPARTMENT OF PUBLIC HEALTH

LUSAKA

2014

Dedication

This Master's thesis is dedicated to my one and only son Isiphosami Luyando Jonathan D'mitri Chizuni and my parents Mr. and Mrs. Chizuni.

Statements

I hereby state that this dissertation is entirely the result of my own personal effort. The various sources to which I am indebted have been clearly indicated in the reference and acknowledgement.

Signed

Nellisiwe Chizuni

Declaration

I declare that this dissertation herein presented for the degree of MPH (HPE&M) has not been previously submitted either wholly or in part for any other Degree at this or any other University nor is it currently submitted for any other Degree.

Signed

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Approved by

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Dr. S Nzala (Principal Supervisor)

Approval Certification

The University of Zambia approves this dissertation of Nellisiwe Chizuni as fulfilling part of the requirements for the Award of the MPH (HPE&M)

Signatures

Dates

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Acknowledgements

I am deeply, deeply indebted to the following for their help and support:

Firstly to the Lord all mighty, for his love and guidance throughout my program.

To my son Isiphosami, for being so understanding when mummy had to study and write her thesis instead of playing with you.

To my parents, Mr. and Mrs. Chizuni, my siblings Pamela, Jonathan, Faith, Hope and Mercy, for their emotional, financial and intellectual support, and have confidence and encouraging me to pursue my dreams.

To the ZAMFOR and Dalhousie University team for allowing me to be part of the research team and use the data collected for my thesis, and their financial support during my research part of my Master's program.

I would like to acknowledge my supervisor Dr. S H Nzala for his guidance and support during the development of the proposal and finally the write-up of the thesis.

Last but not the least I would like to acknowledge my fellow students (Back Benchers) and my friends for being the support system and sounding board during my MPH program.

Abstract

Introduction

Malaria is one of the leading causes of morbidity and mortality in Zambia. It is believed that malaria is responsible for up to approximately 47% of the overall disease burden for pregnant women. In Zambia it is accountable for 20% of maternal mortality. The effects of malaria in pregnancy are many; for the mother, the most common effect is maternal anemia, which reduces her ability to cope with bleeding, leading to hemorrhage during childbirth. Malaria is both preventable and treatable, but it is a complicated disease whose prevention and control requires multiple interventions. If the prevention methods like sleeping under insecticide-treated nets, and indoor residual spraying fail then treatment is imperative. Treatment begins with recognizing the symptoms of malaria, and giving the correct medication. Competency is the simultaneous integration of knowledge, skills, and attitudes required for performance in a designated role and setting. Having competent health workers is one of the ways disease burdens can be alleviated, as this can be used to discover what gaps exist and trainings can be conducted to fill such gaps.

Method

It was a descriptive study done in Gwembe district, southern province, Zambia. All health workers that are in contact with pregnant women were given self-assessment questionnaire and scored according to standard competency of management of malaria in pregnancy. The standards were obtained from text books and experts in the field e.g. medical officers, national malaria center, etc. A baseline of 75% was assumed.

Results

This study showed that the medical practitioner scored an average of 86%, nurses and the mid-wives both scored above the base-line with an average score of 78% and 76% respectively. The others scored 63%. Nurses and mid-wives lacked competency in some of the core competency in management of malaria in pregnancy as they scored low marks.

Lowess test showed that competency score was related to age and years in service

Kolmogorov-Smirnov test showed that only age had a statistically significant relationship with competency score as it had a p-value of 0.04.

Conclusion

The majority of the health workers had the competency in management of malaria in pregnancy with only a few who scored below the base line and had no knowledge of some essential competency. Training is needed to effectively improve the maternal health status and in turn help reduce maternal mortality rate in the district and the whole country at large, as all the health workers will be competent.

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LIST OF ABBREVIATIONS

1. AL Artemether- lumefantrine
2. DOT Direct Observed Therapy
3. DHS Demographic and Health Survey
4. HIV/AIDS Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
5. HMIS Health Management Information System
6. HRH Human Resource for Health
7. IMCI Integrated Management of Childhood Illness
8. IPTp Intermittent Prevented Treatment during pregnancy
9. ITN Insecticide Treated Net
10. LHW Lady Health Workers
11. MDG Millennium Development Goals
12. MINSA Ministry of Health of Nicaragua
13. MIP Malaria in Pregnancy
14. MNCH Maternal and Neonatal Child Health
15. MoH Ministry of Health
16. RDT Rapid Diagnosis Test
17. SILAIS Local Systems of Primary Care
18. SP Sulphadoxine-pyrimethamine
19. USA United State of America
20. ZAMFOHR Zambia Forum for Health Research

CHAPTER 1.0 INTRODUCTION

Competency is the simultaneous integration of knowledge, skills, and attitudes required for performance in a designated role and setting (Spencer. L. M et al., 1994). Indicators are used to confirm whether the competency is present or not. Whilst there has been some argument even confusion about the meaning that should be ascribed to the word 'competence', it is generally agreed that it is concerned with a person's performance of a task. Thus as a concept, it is closely related to the idea of 'skill', or more precisely, 'skill at' performing some task. A term often used to describe the detailed aspects of an individual's job performance (Cole. G. A and Phil. K, 2011).

Malaria is one of the leading causes of morbidity and mortality in Zambia. It is believed that malaria is responsible for up to approximately 47% of the overall disease burden for pregnant women. The effects of malaria in pregnancy are many; for the mother, the most common effect is maternal anemia, which reduces her ability to cope with bleeding, leading to hemorrhage during childbirth (Steketee. R et al., 2008). Malaria poses a particularly high threat to the pregnant woman and her unborn baby, contributing to elevated levels of maternal and neonatal death and morbidity. In Zambia, the maternal mortality ratio currently stands at 591 per 100,000 live births evidence that there is much work to be done (Central Statistical Office (CSO) [Zambia] and Macro International Inc, 2009). Competence assessment of health workers is one of the ways disease burdens can be alleviated, as this can be used to discover what gaps exist and trainings can be conducted to fill such gaps. In Zambia competence assessment among health workers for case management of malaria, let alone any other disease is still an uncharted avenue for ways to improve health care service. Currently what are done are evaluation standards with indicators to assess structures and systems that support health service delivery. This tool consists of a list of

key standards for integrated reproductive health services with verifications criteria to be assessed during each observation of service provision. Malaria in pregnancy (MIP) falls under the verification criteria for focused ante-natal care (Wallon. M et al., 2010). These quality assurance programs are only on the systems and not on the healthcare providers themselves. Healthcare providers also have to be assessed to ensure they have the skills and knowledge to operate these same systems. This is one of the ways quality assurances of malaria diagnosis and anti-malaria medicine can be optimized.

Not many studies have been done on the competence measuring of health workers and none have been done on case management of MIP in the world. Competence levels of healthcare providers are important to ensure that the health status of the population is at optimum for excellent health care delivery. Around the world, in countries like USA this has been used for; Certifications and re-certification of health care providers, healthcare reforms (JCAHO (Joint Commission on Accreditation of Healthcare Organisation), 1996), organizational performance, planning for new services, selection of new staff, risk management, liability and ethics, and measuring training outcome (Roll Back Malaria, 2009), e.g. WHO has recommended clindamycin plus quinine as the drug of choice for the treatment of malaria in the first trimester of pregnancy and as a second-line anti-malarial drug for other cases based on consensus opinion even in the absence of evidence from systematic review (World Health Organisation, 2010). This means health workers must be trained on the use of clindamycin. In Africa competences assessments have been used to come up with interventions that will improve health status of their people and also help them meet the MDGs (Sloan. D. A et al., 1993, Ariff et al., 2010, Mutungi. A et al., 2011).

The health workers shortage in Zambia has created a problem, especially in rural areas where most of the health centers are managed by unqualified or one qualified staff per center (Ministry of Health in Zambia, 2011). To deal with this problem task shifting is being used. This is where people are asked to do the job they are not qualified or trained for. This has helped, but leads to questions of how this has helped with the improvement of the health status level in these communities. Effective disease management requires prompt diagnosis and correct treatment with effective medicines and supportive management. A critical mass of competent health workers is needed with adequate skills for diagnosis and treatment of diseases. Health workers in Gwembe will be assessed on their knowledge and skill levels in case management of MIP to determine what levels of competency each worker has. Assessment of competence of practicing nurses has been identified as crucially important in maintaining professional standards, identifying areas for professional development and educational needs, and ensuring that nurse competencies are put to the best possible use in patient care (Yates. Patsy et al., 2000).

1.1 STATEMENT OF PROBLEM

Malaria accounts for 20% of maternal mortality in Zambia (National Malaria Control Centre (NMCC)). The pregnant women in more remote and impoverished areas are the ones that greatly contribute to this 20%. Malaria is both preventable and treatable, but it is a complicated disease whose prevention and control requires multiple interventions. If the prevention methods like sleeping under insecticide-treated nets, and indoor residual spraying fail then treatment is imperative. Treatment begins with recognizing the symptoms of malaria, and giving the correct

medication (UNICEF). The health workers must have the correct knowledge to treat malaria at its various stages.

In Zambia the health care quality is still lagging behind, although number of interventions has been put in place to tackle this problem. The measuring of the competences among health workers is unfortunately not one of them. Gwembe district has health care staff at 28% of its establishment. This has greatly affected the delivery of health care services such as malaria case management. Malaria tops the ten major causes of mortality and morbidity in the district, at an incidence of 599/1000 population and cases in pregnancy at 205 in 2011(National Malaria Control Centre (NMCC), 2012). From the DHS done in 2007, it showed that southern province had the lowest number of pregnant women sleeping under ITN at 20% (Central Statistical Office and Ministry of Health, 2009). This situation is no different in Gwembe, being one of the districts found in Southern province and also since malaria tops the major causes of morbidity and mortality. This means that pregnant women in this district are at a higher risk of getting infected with the malaria parasite than any other pregnant woman in the other provinces. Bringing in the importance of measuring of competences among health workers in Gwembe as the women in the district are at a high risk of being infected with the malaria parasite as they do not use ITNs.

1.2 JUSTIFICATION

It has been reported from various research studies (Greiner. A.C and Knebel. E, 2003), (Meretoja. R et al., 2004), done in developed countries like the United States of America, Canada, etc. that to ensure better quality of health care service delivery, and to meet the 21st Century health care system, competence assessments of health care providers is required. This

ensures that the clients of health facilities get the best possible care at each visit, leading to client satisfaction and resulting in better health status of the community(Kak. Neeraj et al., 2001).

As far as my knowledge, a study of this nature has never been done in Zambia; there is no literature in Zambia of research studies on competence measuring of health workers in the case management of MIP or even any disease. Since Malaria is leading in the cause of mortality and morbidity in Gwembe district, and pregnant women are more vulnerable to the disease; this can be due to lack of competency in the case management of MIP by the health workers. Most of the study on measuring competences among health workers have been designed and conducted in developed countries. Results from these studies has helped improve the quality of health care services in these countries and resulted to better health status of the population(Kak. Neeraj et al., 2001). As part of the 2011 action plan for the Ministry of Health, the Ministry aimed to improve the productivity and performance of health workers. To monitor and see if performance levels of health care providers is increasing or up to standard then competence measures have to be done(Ministry of Health in Zambia, 2011).

2.0 LITERATURE REVIEW

Malaria is one of the most severe public health problems in the world. It is a leading cause of mortality and morbidity in many developing countries, where young children and pregnant women are the groups most affected (Centers and Disease Control and Prevention, 2010). In Sub-Saharan Africa, the part of the world most affected by malaria, as many as 10,000 pregnant women die each year of malaria-related causes, chiefly anaemia (Roll Back Malaria, 2009). The problem of malaria in pregnant women is that the drugs that can normally be used to treat this condition cannot be used. This is because some of the common drugs of malaria treatment are harmful to the woman in her vulnerable condition and the developing baby. A woman's immune system is affected during pregnancy, making her more susceptible to developing malaria which at times even leads to death of the child before birth or right after delivery. More than three million pregnant women are affected with malaria in developing countries. There are many adverse effects of malaria in pregnant women, some adverse effects are:

- Anaemia (both maternal and foetal).
- Fever.
- Altered blood sugar levels.
- Infection that harms the genitals.
- Build-up of fluids in the lungs.
- Chances of cerebral malaria or other neurological problems (Vatsal. Anand, 2011).

In Zambia all the ten provinces are considered highly endemic for malaria. The parasite *P. falciparum* is transmitted year-round by the female anopheles mosquito, though transmission rates tend to be highest during the rainy season, which lasts from approximately November to April. The entire population in Zambia is at risk for malaria, which has particularly severe health

implications for pregnant women, children under five, and people living with HIV/AIDS. In pregnant women, infection rates have been shown to be highest in the first and second pregnancies, with lower rates in subsequent pregnancies (Steketee, R. W et al., 2001). As data on the reported cases of MIP are not routinely aggregated at the national level, it is unknown what the current incidence of MIP is in Zambia. Based on extrapolations from 2000 census figures, however, it is estimated that there will be approximately 716,192 pregnancies in Zambia, all of which will be at risk for malaria (Central Statistical Office Zambia, 2001). Malaria is one of the leading causes of morbidity and mortality in Zambia. In 2008, 3.2 million cases (clinically or laboratory diagnosed) were reported, causing 3,871 deaths. It is believed that malaria is responsible for up to approximately 47% of the overall disease burden for pregnant women. The effects of MIP are many. As the malaria parasite is sequestered in the placenta, there are additional risks for premature birth, intrauterine growth retardation, low birth weight, spontaneous abortion, stillbirth, and congenital malaria in the new-born (Wallon, M et al., 2010).

Competence among health workers is very important as it is a major determinant on their performance. Knowledge and skills alone learnt in school are not enough to fully handle the health problems in a community, as the needs of each community differ from each other. There are skills related to competencies that are further advanced during practicum or on the job (Lenburg, C. B, 1999). The core competencies that are used among healthcare providers in case management of MIP are

- Ability to confirm malaria infection either by microscopic examination (the current gold standard) or by using a rapid diagnostic test that detects a specific parasite antigen.

- Knowledge of what type of drugs can be used at each stage of pregnancy if infected with the malaria parasite.
- Having or possessing the knowledge to differentiate between an uncomplicated malaria case and a complicated and severe malaria case.
- Ability to determine if the administering of malaria drugs can be given even if not confirmed of having the malaria parasite by microscopy or rapid diagnostic test.
- Supply and management of drugs and diagnostics and other logistics.
- Use of the health management information system, including filling in data collection forms, data analysis and reporting on program indicators(Atta. H et al., 2009).
- Management of treatment failure.
- Management of malaria in pregnant women with special needs i.e. HIV, Sickle Cell Anaemia and Anaemia(Bart-Plange. Constance et al.).

Competence measurement is critical to ensuring that all employees are competent to perform their assigned duties and responsibilities, and to meet performance standards. There is general agreement in the literature that assessment of competence should involve more than one indicator. In a review and discussion paper published in 2006, McGrath states that technical skills are easier to measure using standardized tools, whereas non-technical skills require a level of judgment on the part of the assessor, taking into account other factors such as private life issues or personality of the candidate to name a few, that may not be considered using

assessment tools. Queensland Nursing Council review identified a range of items that may be used as indicators/tool for competence assessment in clinical nursing practice:

- Continuing education – is voluntary or mandatory wherein a certain number of hours of learning activities are required, usually within a set time period. This can be through classroom or web-based learning, journal article review, or application of active practice hours.
- 360-degree evaluation instrument – is a process consisting of tools completed by multiple people in a candidate's sphere of practice (e.g., peers, supervisors, students, clients, general public). Most 360-degree evaluations using rating scales, with the ratings being summarized for all evaluators by topic, and feedback provided to the candidate overall.
- Direct observation – is a process where the health worker is observed in clinical setting instead of a contrived examination format.
- Self-assessment – is where the health worker assesses himself. This has been reported as the most common form of competence assessment. It may be a useful starting point for other forms of assessment.

While a range of indicators have been proposed, research providing evidence of the reliability and validity of these indicators and the tools used to measure them is limited (UNICEF), (Deborah. A. V, 2004). All these different tools can be used in Zambia in respect to malaria or any other disease. Of the four types of tools, 360-degree is the most tedious as it involves a number of people but is the one that provides a holistic picture of the candidate.

Regardless of the method used for measuring competence, a scoring technique is needed. In order to develop a measure, data (test scores, observations, records) must be analyzed to derive scores, which indicate the provider's level or extent of competence. The analysis involves comparing the data to a standard of competence. A level of competence is defined in relation to a standard. Competence can be above or below the standard, or in some cases it can be stated as a proportion of the standard, such as 70% of the standard(Harden. R. M and Gleeson. F. A, 1979). International and national health organizations such as the World Health Organization, medical societies, the Agency for Healthcare Research and Quality, and national health ministry's establish standards for patient care, based on evidence from the scientific literature as interpreted by expert panels. Standards of competence can also be based on the performance of individuals selected as excellent clinicians(Benner. P, 1982). Alternatively, behaviours that differentiate between experienced and inexperienced providers can be used as the standards of competent performance(Sloan. D. A et al., 1993).

When choosing the tool to use when assessing competences it should be:

- Reliable – is the consistency of scores for a particular person with respect to a particular competency when evaluated by different methods, by different raters, or for more than one patient.
- Valid – is concerned with the degree a particular measurement is able to measure what it's supposed to measure. It provides a direct check on how well the measure fulfils its function.
- Feasible – is where the tool is able to work (Kak. Neeraj et al., 2001).

The study that was done in the United States of America on 'Measuring the Competence of Health Care Providers', concluded that competence can be assessed using tests or inferred from

performance that has been assessed using various tools. The major advantage of tests is that single competencies can be distinguished and targeted for improvement. The major advantages of directed observation method is that they are more predictive of job performance(Kak. Neeraj et al., 2001).

A number of studies have been conducted on measuring of competency of health workers on different health issues in the world.

Shabina Ariff et al conducted a study in Pakistan where the competencies of health workers in maternal and neonatal issues were evaluated in the public health sector. Pakistan has one of the highest perinatal and neonatal mortality rates in the region and contributes significantly to global neonatal mortality. The high mortality rates are partially attributable to scarcity of trained skilled birth attendants and paucity of resources. Empowerment of health care providers with adequate knowledge and skills can serve as instrument of change. The performance of Lady Health Worker (LHWs) form the first tier of trained cadre that provides Maternal and Neonatal Child Health (MNCH) at primary care level and in the community, in knowledge of MNCH was good with 30% of them scoring more than 70%. The Medical officers (MOs), in comparison, performed poorly in their knowledge of MNCH with only 6% of them scoring more than 70%. All three cadres of health care providers performed poorly in the resuscitation skill and only 50% of them were able to demonstrate steps of immediate new-born care. The MOs performed far better in counselling skills compare to the LHWs. Only 50% of LHWs could secure competency scale in this critical component of skills assessment. It showed that all the three cadres (Medical officers, Lady Health visitors i.e. nurses/midwives and Lady Health workers) of health workers performed way below the competence levels for knowledge and skills. This indicated a serious

deficiency in the knowledge of basic maternal and neonatal care, and hence did not have the capacity to make a serious indent in the maternal and newborn mortality rates of the country. It also highlighted the need for periodic assessment of health worker trainings and skills to address gaps and develop targeted continuing education modules. This lead to the recommendation to all stakeholders to revise current curricula and training guidelines, and periodic quality checks and refreshers to optimize system reforms thereby leading to the achievement of the MDG 4&5(Ariff et al., 2010).

A similar study was done in Cameroon on competence of health workers in caring of newborn at birth. It is a setting similar to Zambia with a shortage of health workers, poor hygienic conditions and organization to support the provision of care. In Cameroon, the neonatal mortality rate was 40 per 1000 live births in 2004. Several trials have shown that health workers in some countries can perform neonatal resuscitation with an estimated effect of 20% reduction of these deaths. The World Health Organization Essential New-born Care (WHO ENC) course has set minimum standards for training midwives in this domain. It has been shown that in facilities where midwives have received this training there has been a decrease in early neonatal mortality rates. The competence of health workers was good as the scores were respectively 100% in the domain of neonates' identification, 100% for ENC tasks and 100% in the area of prevention of infection. This level of competence observed was surprising as we noticed that only 2 health workers had WHO ENC training course and none of them had a refresher course for the past two years. The number of years in the field and the real profile of the health worker could have influence this results even though, it has been shown that written and performance scores decreased significantly six months after training of health workers. Health workers were not competent at

resuscitating new-borns who did not breathe at birth as they scored 24% because of lack of skills and training. The conclusion was that health workers were competent at providing basic essential newborn care, but lacked skills for proper handling of newborns that did not breathe at birth. It showed that there is an urgent need to reinforce the capacity of health workers in health care facilities, as far as resuscitation is concerned in order to meet MDG 5 by the year 2015 (Monebenimp. F et al., 2011).

In Kenya a study was done on the assessment of health workforce competency and facilities' readiness to provide quality maternal health services. Because delivery by a skilled birth attendant is crucial to the health of women and new-borns, skilled attendance at delivery has become a proxy indicator for reducing maternal mortality. In Kenya, where the assessment reported here was carried out, WHO estimates that only 41.6% of mothers are delivered by a skilled attendant and as many as 1,000 mothers die for every 100,000 live births. Further, several studies (Harvey. S.A et al., 2004), (Harvey. S. A et al., 2007) show that even among health workers classified as "skilled birth attendants," competency levels are often quite low. On average, providers answered 63% of the knowledge test questions correctly. Skills were assessed in the following order: active management of the third stage of labor (AMTSL), manual removal of the placenta, bimanual uterine compression, immediate new-born care, and neonatal resuscitation with ambu bag. Average skills scores varied, but in every area except active management of the third stage of labor (slightly above 50%); providers completed fewer than half the necessary steps correctly. Collectively, providers earned a relatively high score for proper use and handling of gloves (84%) and a lower score for proper hand washing, done correctly by 60% of providers. The health workforce had an above average competency of 63%,

but the basic life-saving skills were low. Thus the current levels of provider competence were far below the expected as per the current evidence-based standards. It lead to the recommendation to the appropriate MoH (Ministry of Health) officials to design a quality improvement interventions based on the results(Mutungi. A et al., 2011).

In Kenya a study on Health workers performance in the management of paediatric fevers following in-service training and exposure to job aids in Kenya. In 2007, a new initiative was launched in one part of Kenya to improve malaria case-management through enhanced in-service training and provision of job aids. It consisted of several units including: the epidemiology of malaria in Kenya, diagnosis-treatment-counselling-drug dispensing for uncomplicated malaria, diagnosis and treatment of severe malaria, prevention and management of malaria in pregnancy, basic techniques related to stock management of Artemether-lumefantrine (AL), principles of monitoring and evaluation and practical sessions on diagnostic procedures using blood slides and rapid diagnostic tests [RDTs]. The study found that 1) No health facility or health worker was exposed to all components of the intervention; 2) the proportion of health workers who received the enhanced in-service training was 67%; 3) the proportion of febrile children with uncomplicated malaria treated with the first-line anti-malarial drug, artemether-lumefantrine (AL), at health facilities where AL was in stock increased from 76.9% (95%CI: 69.4, 83.1) to 87.6% (95% CI: 82.5, 91.5); 4) there were modest but non-significant improvements in dispensing and counselling practices; and 5) when the analyses were restricted to health workers who received the enhanced in-service training and/or had received new guidelines and job aids, no significant improvements in reported case management tasks were observed compared to baseline. This study brought to light the fact that in-service trainings and job aids alone was not

adequate to improve the prescription, dispersions and counseling tasks necessary to change malaria case management practices. The inclusion of supervision and post-training follow-up was to be considered in future clinical practice change initiatives (Wasunna. B, 2010).

In South Africa a study was done on the Evaluation of the Quality of Integrated Management of Childhood Illness (IMCI) Assessments among IMCI Trained Health Workers in South Africa. The health workers were trained in IMCI guidelines to improve coverage of essential child health interventions by improving case management skills of first level health workers, strengthening the health system for effective management of sick children, and promoting good community child care practices.(Bryce. J et al., 2005) In most cases health workers used IMCI to assess presenting symptoms but did not implement IMCI comprehensively. All but one health worker referred to IMCI guidelines during the period of observation, 9(12%) observed health workers checked general danger signs in every child, and 14(18%) assessed all the main symptoms in every child. Only 51/109(46.8%) children with severe classifications were correctly identified. Nutritional status was not classified in 567/1357(47.5%) children. This showed that health workers are implementing IMCI, but assessments were frequently incomplete, and children requiring urgent referral were missed. For key child survival interventions to be improved, interventions are required to ensure competency in identifying specific signs and to encourage comprehensive assessment of children by IMCI practitioners(Horwood. C et al., 2009).

Wong YC et al in 2011 conducted a study in Nicaragua on the Evaluation of Medical and Nursing Competencies in Antenatal, Delivery, and New-born Care in Five Local Systems of Primary Care (SILAIS) in Nicaragua. Nicaragua's 2011 National Health Plan provides that health staff have the skills necessary to prevent, detect, and treat, in a timely manner, health

problems and complications that arise during pregnancy and childbirth, as well as the postpartum and new-born periods. Ensuring that health workers have these skills will contribute to reducing maternal and new-born morbidity and mortality. In 2005 the Ministry of Health of Nicaragua (MINSA) conducted the first study of competencies of health staff that provide maternal and new-born services. Based on those results, MINSA, in conjunction with external agencies and projects, developed norms, protocols, and clinical practice guides which allowed for national-level standardization of clinical competency. In addition, MINSA and other agencies worked together to develop tools for continual monitoring of the quality of services.

Five years after this initial evaluation, MINSA was interested to know whether the interventions to improve staff competencies had an impact. In the knowledge test, health personnel achieved an overall score of 72%, an increase of 14 percentage points ($p < 0.001$) from the 2005 results. The areas which suffered a reduction in knowledge in relation to the 2005 findings were the interpretation of the partograph, which decreased by eight percentage points (from 59% to 51%) and contraception following an obstetric event, which fell by one percentage point (from 75% to 74%), but this change was not statistically significant. In the skills assessment, health workers achieved an overall score of 67%, an increase of eight percentage points from 2005. Health care providers achieved an average score of 71% for immediate care of the new-born; three percentage points lower than the score from 2005.

The results of this study reveal significant improvement in competencies for maternal and neonatal care between 2005 and 2010. There was an overall improvement in knowledge from 58% in 2005 to 72% in 2010 and an improvement in skills from 59% in 2005 to 67% in 2010. This led to a number of recommendations and some of them are; Activities and technical assistance for improving the knowledge and skills of health workers should be specifically

directed toward the treatment of gestational hypertension and hemorrhagic shock, identification of risk factors for predicting perinatal asphyxia, and interpretation of the partograph for timely decision-making. Strengthen teamwork among obstetricians and paediatricians to promote best practices that contribute to the reduction in new-born morbidity and mortality. Incorporate systematic assessment of knowledge and skills, using anatomical models, into performance evaluations of medical and nursing staff that provide care during pregnancy, childbirth, postpartum, and new-born periods(Wong. Y. C et al., 2011).

The literature review has shown that competency assessments of health workers is a way of determining what gaps in skills and knowledge are currently there and appropriate recommendations can be made. When these recommendations are followed there is an improvement in competency levels of health workers, which has led to better health outcomes as it was shown from the study done in Nicaragua, South Africa, etc. When a similar study of measuring competency of health workers is done in Zambia, it will help improve the health outcomes of the population as the gaps in the knowledge and skill will be identified and rectified. It has also shown that competency assessment of health worker in case management of MIP has never been done in the world.

2.1 RESEARCH QUESTION

1. What are the competency levels in handling malaria cases in pregnant women among healthcare providers in Gwembe district?

2.2 GENERAL OBJECTIVE

⇒ To evaluate competence in case management of malaria in pregnancy among health workers in Gwembe district.

2.3 SPECIFIC OBJECTIVE

1. To determine the knowledge health workers have on case management of MIP in Gwembe district.
2. To determine what gaps are there in the competence levels of health workers in Gwembe district.

3.0 METHODOLOGY

3.1 Research Design and Setting

This was a descriptive cross-sectional study using quantitative data. Secondary data used was generated by a study conducted in 10 health facilities in Gwembe district. Gwembe district is located in the Southern Province of Zambia, 200km south of Lusaka. It has a population of 46,017 and covers an area of 12,611 km². The district has 1 first level Hospital, 8 Rural Health Centers and a Hospital Affiliated Health Centre.

3.2 Target Population

The target population was all health workers in Gwembe district.

3.3 Study Population

The study population was all health workers that deal with pregnant women and are involved in the diagnosis and treatment of malaria in Gwembe district that meet the eligibility criteria.

3.4 Inclusion Criteria (Eligibility Criteria)

The criteria for the inclusion in this study was all health workers that deal with pregnant women and are involved in malaria diagnosis and treatment e.g. mid-wives, clinical officers, laboratory technician, nurses in Gwembe district.

3.5 Sample Selection

The selection of study participants was done by purposive sampling to select the health workers and all the health facilities were sampled.

3.6 Sample Size

Due to the location of the study all the health workers that deal with pregnant women and are involved in malaria diagnosis and treatment were selected.

3.7 Data Collection

Secondary data used was generated by the HRH project “Evaluating the Availability of Adequately Trained Health Care Providers in Rural Zambia through Competency Assessment and Outcome Mapping”. This was a research project done in two rural districts of Zambia, (Gwembe and Chibombo) to evaluate existing HRH retention and recruitment strategies, and also assessed the degree to which the competencies of the workers are suited to specific health needs of the populations they serve. The project were led by research and policy-making partners from Zambia and Canada, including members of synergistic units-Zambia Forum for Health Research (ZAMFOHR) in Zambia, and the WHO Collaborating Centre on Health Workforce Planning and Research in Canada. The top disease burden for the two districts were obtained from HMIS and surveys conducted by the project. It was found that malaria was top for Gwembe and HIV/AIDS for Chibombo. A need-based competency framework was used to collect the data. The competencies required to deal with malaria were generated from experts in the field e.g. medical officers, national malaria center, text books on malaria competency, etc. The health worker were then given a self-assessment questionnaire and scored according to the standard that has been already established in various literatures. This project ran from 2009 to 2012. Competencies for case management of malaria in pregnancy were extracted from the questionnaire as it was made for general case management of malaria(Goma. M. F et al., 2009).

3.8 Data Processing and Analysis

The researcher assumed base line knowledge and skills of health worker at 75%. This is because malaria is a serious disease that has killed a lot of people in Africa and high competency level is needed if the fight of this disease is to be won. The questionnaire will marked out of 100 to obtain the competency score of the health workers. The quantitative data was entered and analyzed using STATA 12, to come up with comparison of competency scores among the different demographics characteristic; age, number of years work experience and profession.

A nonparametric regression Lowess (locally weighted scatterplot smoothing) was used to check if competency score was related to age and years in service.

Kolmogorov-Smirnov test was used to test the significance of the relationship.

3.9 Ethical Consideration

Ethical approval was obtained from University of Zambia Biomedical Research Ethics Committee, and permission from Zambia Forum for Health Research was obtained to use their data.

Participants were assured of complete confidentiality and anonymity as no names but codes will be placed on any of the forms used for data collection. The data collected was used only for the purpose of the research and only individuals involved in the research had access to it.

3.10 Limitation

The sample size and frame was not representative of all the districts in the country but it can provide an illustrative model for the other districts. Due to the size of the sample they would have been no variation in the sample making it truly difficult to state the significance in the regression results.

CHAPTER 4.0 PRESENTATION OF RESULTS

4.1 DEMOGRAPHIC RESULTS

This study measured the competency of health workers in Gwembe district in the case management of MIP. They were 22 health workers interviewed; these were medical practitioner (doctor and clinical officer), nurses, midwives and others (environmental technician and laboratory assistant). The years of experience ranged from 7 months to 17 years of working experience. The table below shows the participants demographic characteristics.

<u>Profession</u>	<u>Number</u>	<u>Age</u>	<u>Number</u>
Medical practitioner	2	20 – 29 years	9
Nurse	8	30 – 39 years	7
Midwives	5	40 – 49 years	6
Others	7		

<u>Years of Service</u>	<u>Number</u>	<u>Gender</u>	<u>Number</u>
<1 year- 10 years	12	Male	12
11 – 20 years	10	Female	10

Table 1: Social demographic distribution of the participants

4.2 OVERALL COMPETENCY RESULTS

The results of the level of competency are as shown in the figure 1 below. The medical practitioners, nurses and midwives on average scored above the baseline of 75% indicating that they had the competency needed in case management of MIP and the others scored below the baseline indicating that they were not competent.

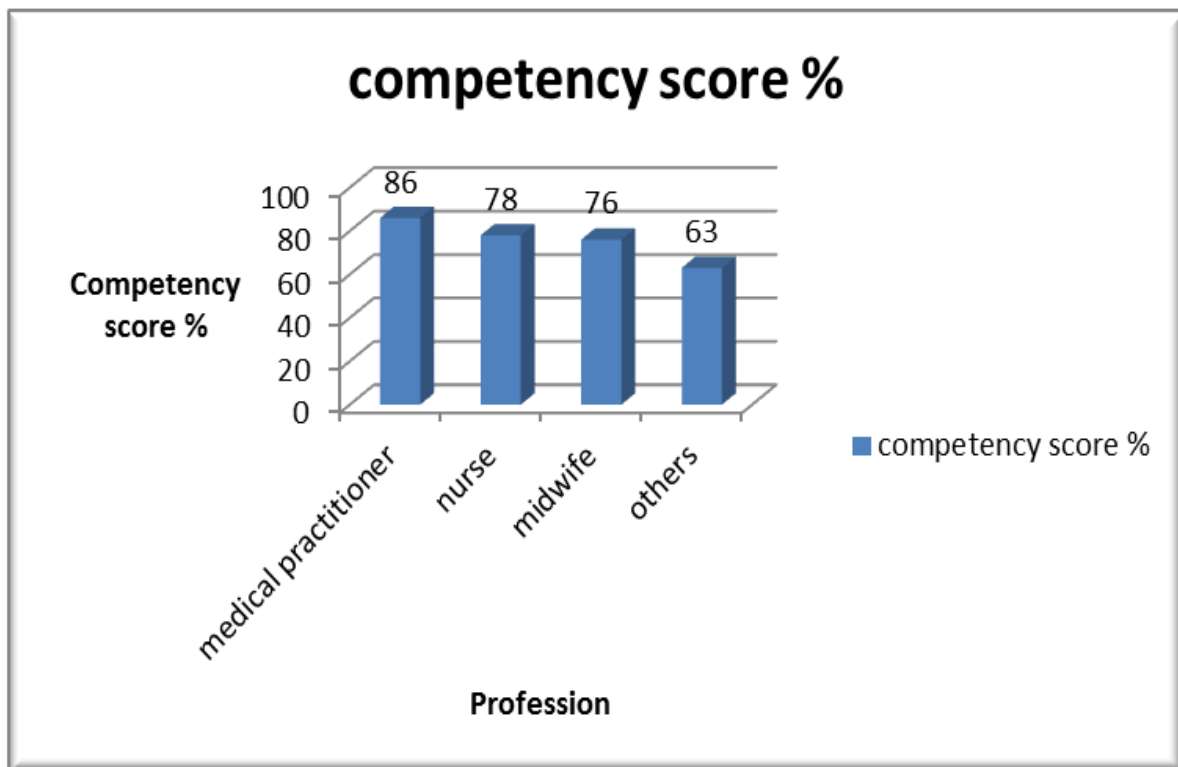


Figure 1: Comparison of Average Competency Score of the different profession

The study brought to light that age and years in service plays a factor in the level of competency an individual has. The participants who were 40 yrs. and above and those who have worked for

more than 11 yrs. had an average competency score below the pass mark of 75%. This can be seen in the figure 3 and 4 respectively.

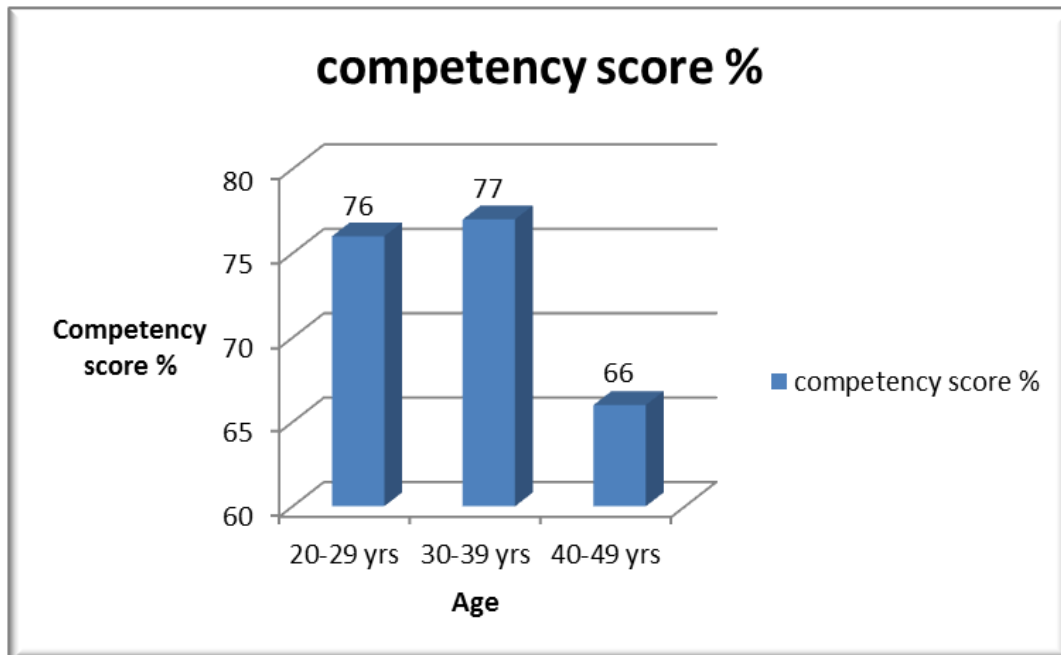


Figure 2: Comparison of average competency score by age.

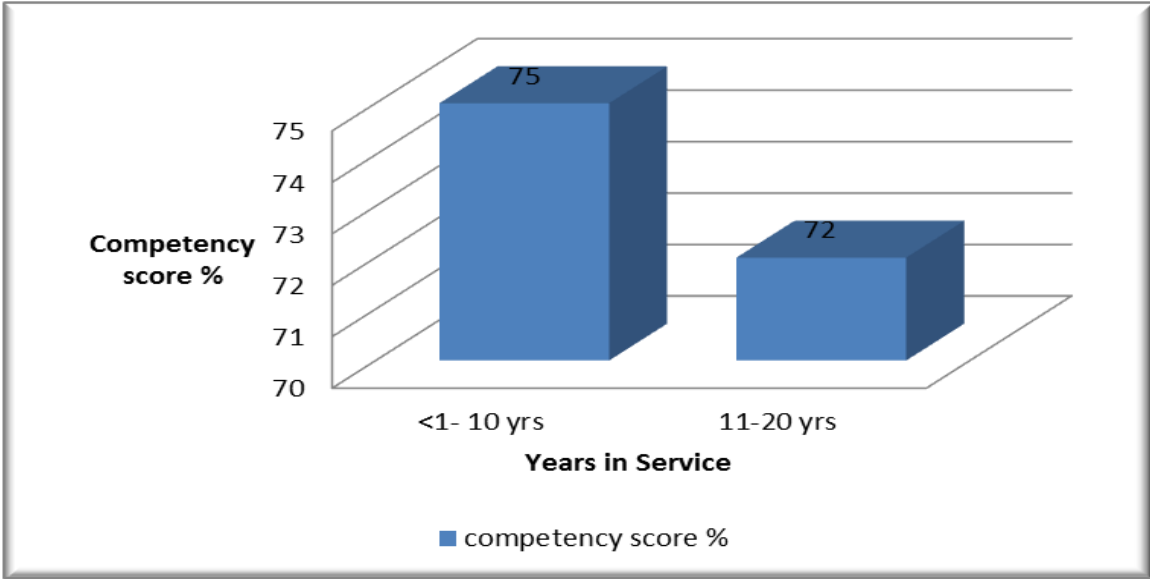


Figure 3: Comparison of average competency score by years in service.

4.3 RESULTS ACCORDING TO THE CORE COMPETENCY OF CASE MANAGEMENT OF MALARIA IN PREGNANCY

When the scores of the core competency was assessed, all the health workers scored below the cut-off mark of 4 for laboratory test services and scored above the cut-off mark for administration of medicine and management of drugs and diagnostics. This distribution can be seen in figure 4 below.

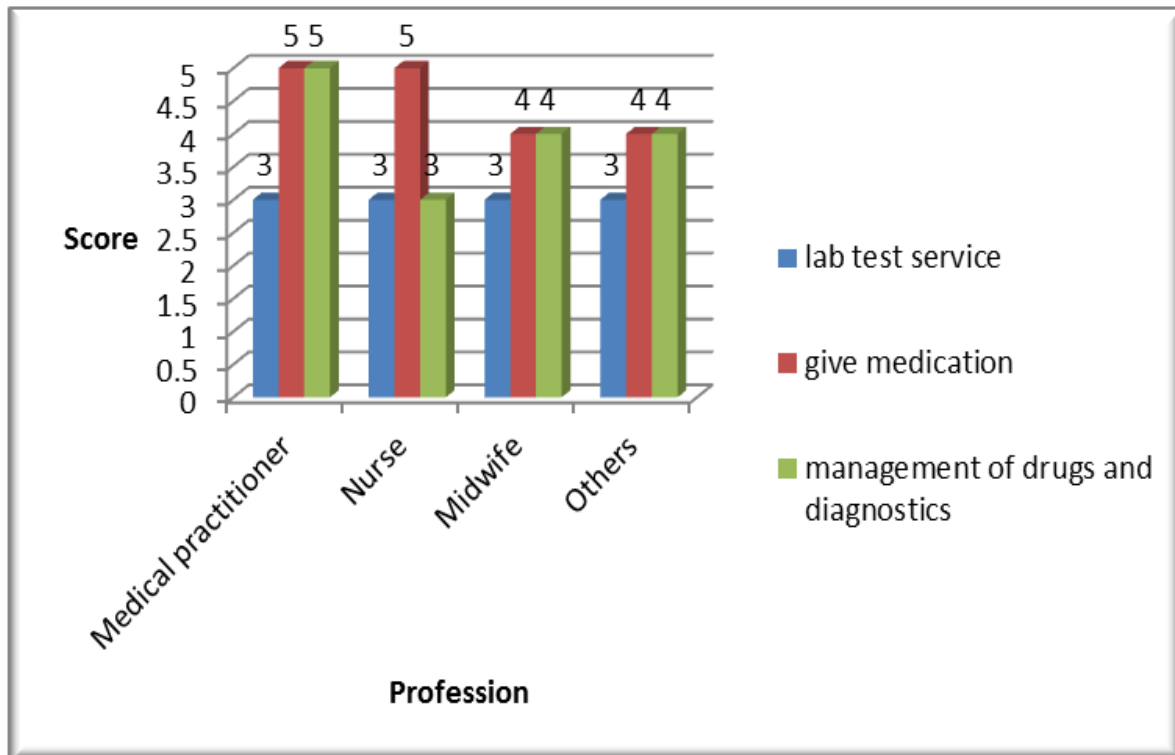


Figure 4: Distribution of scores for the different profession in laboratory test, giving medication and management of drugs and diagnostics.

In the competency of case management of a patient with malaria plus other causes of morbidity, differentiating between simple and complicated malaria and managing adverse effect of

treatment, the medical practitioners scored full marks. Nurses and midwives scored below the cut-off mark in the competency of case management of a patient with malaria plus other causes of morbidity. The others only scored above the cut-off mark on the competency of differentiating between simple and complicated malaria. This is shown in the figure 6.

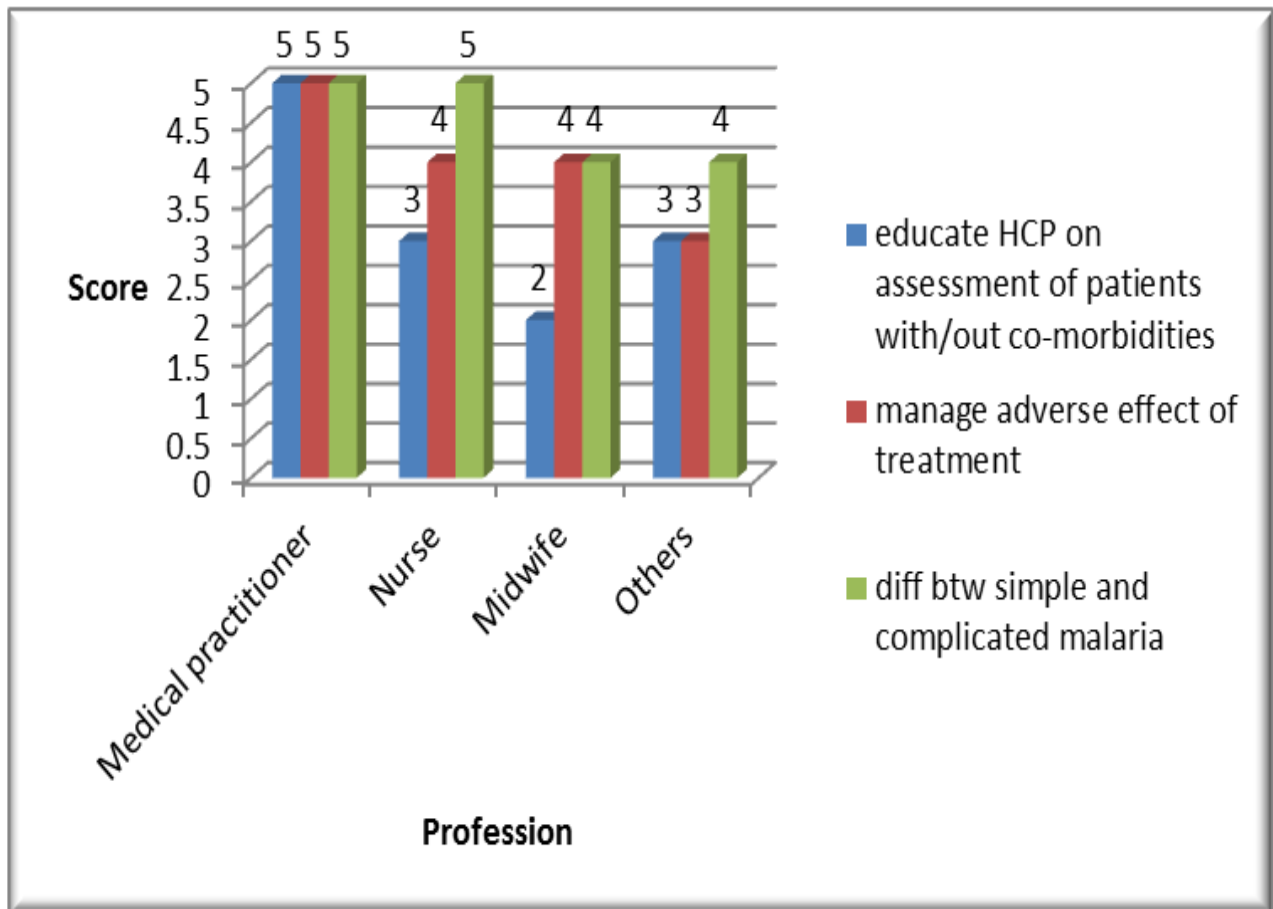


Figure 5: Distribution of scores for the different profession in managing adverse effect of treatment, differentiate between simple and complicated malaria and management of malaria with patients that have other causes of morbidity.

Lowess was used to see if competency score was related to age and years in service. From the figures 6 and 7 it can be seen that, years in service and age have some relation with competency score as they had a form some discernible pattern or shape

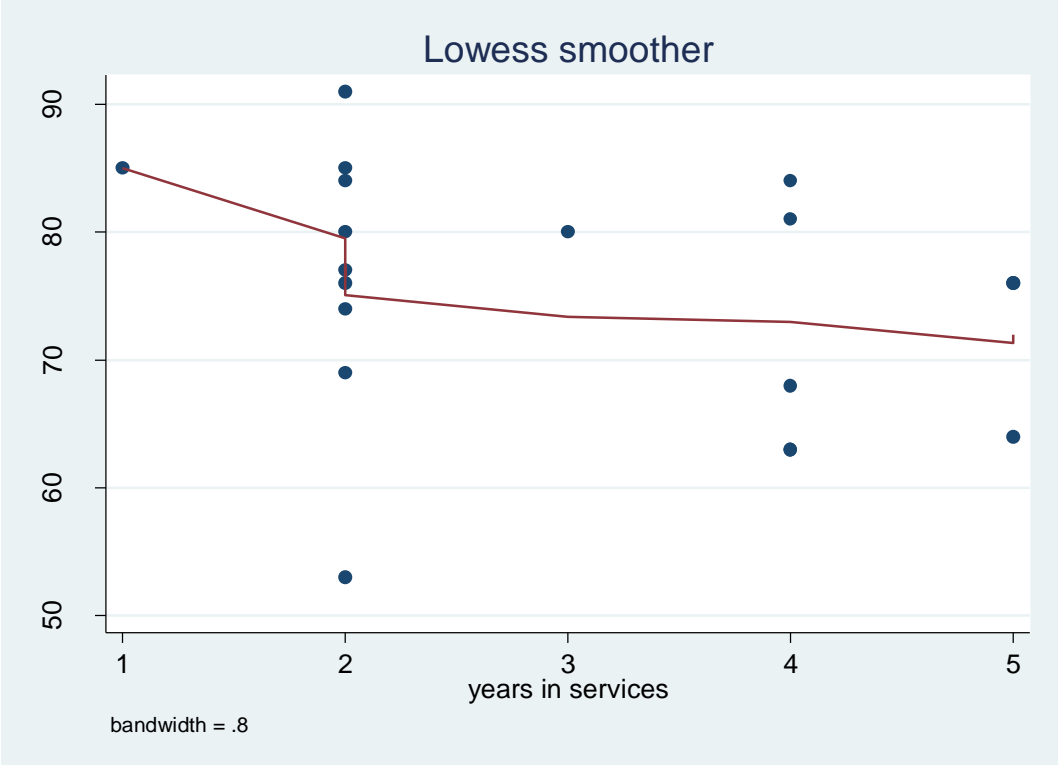


Figure 6: Lowess graph Competency score Vs Years in service

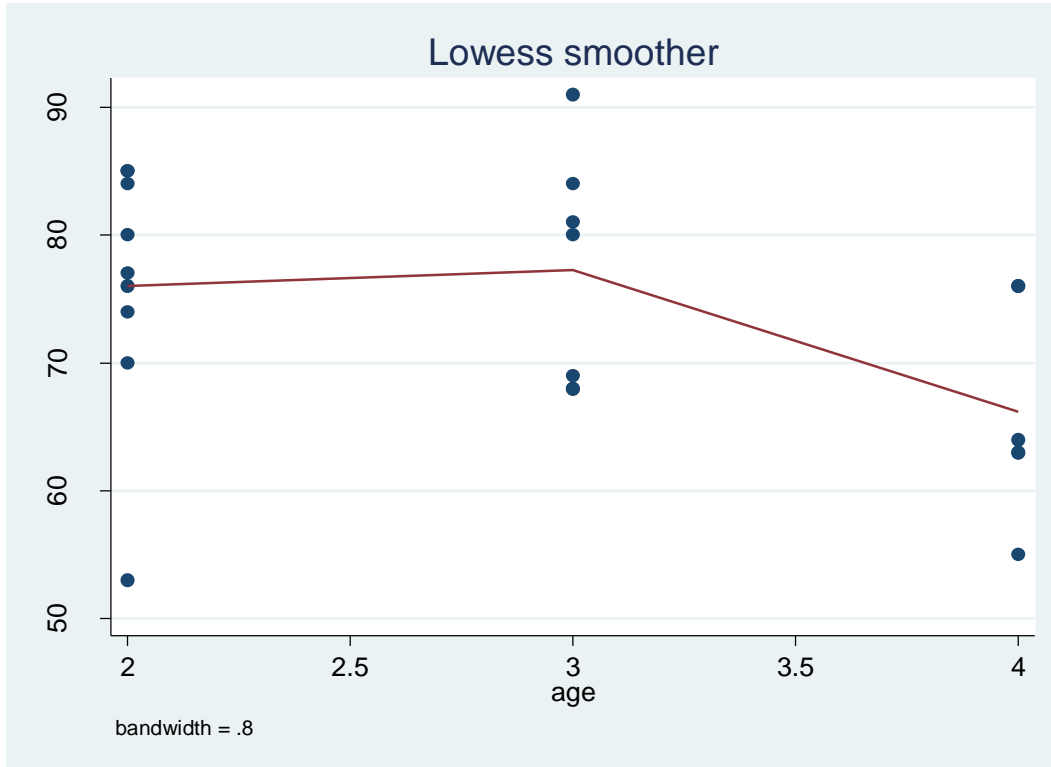


Figure 7: Lowess smoother graph Competency Score Vs Age

Kolmogorov-Smirnov test was used to test if there was significant relationship between competency score and age or years in service. The results should that there is no significant relationship between competency score and years in service, as the p-value was greater than 0.05. This is seen in table 2

Smaller group(years in service)	D	P-value	Corrected
1	0.1538	0.777	
2	-0.3162	0.345	
Combined K-S	0.3162	0.662	0.543

Table 2: KSmirnov test of Competency score and years in service at 10% Conf. Interval

When it came to Kolmogorov-Smirnov test for Competency score and age, it showed that there was a statistically significant relationship between competency score and age as its corrected p-value was 0.04 at 10% confidence interval. This can be seen in the table 3 below.

Smaller group (Age)	D	P-value	Corrected
1	0.0625	0.966	
2	-0.6042	0.041	
Combined K-S	0.6042	0.083	0.042

Table 3: KSmirnov test of Competency score and age at 10% Conf. Interval

CHAPTER 5.0 DISCUSSION

The overall results have shown that most of the cadres have the competency to carry out their responsibilities in the case management of MIP. The medical practitioners (doctor and clinical officer), nurses and midwives scored above the baseline at 86%, 78% and 76% respectively, while the others (laboratory assistant and environmental technician) scored below the baseline at 65%.

The medical doctor and the clinical officer scored the highest scores 90% and 80% respectively. This meant that they have knowledge needed to deal with MIP and especially in the case of complicated malaria and adverse effect of the treatment as they are the ones that normally handle such cases and is also a reflection of the type and intensity of their pre-service training. Nurses and midwives are instructed to transfer all complicated malaria cases and adverse effect of treatment of malaria in pregnant women from health centers to district hospitals where they are attended to by more qualified health workers e.g. doctors (Wallon. M et al., 2010).

When competency was viewed individually, it showed that key health professionals that come in regular contact with the pregnant women lacked vital knowledge needed in the case management of MIP. The study showed that 5 of the nurses and 2 of the midwives failed to score above the minimum competency level in the administration of drugs and diagnostics, 4 of the midwives and 4 of the nurses did not have the competency to manage a patient with malaria with other causes of morbidity, a nurse and midwife scored below the minimum competency level for the management of the adverse effect of treatment. These are part of the core competencies that are needed in the case management of MIP, hence needed if the fight against malaria in pregnant women is to be won. Midwives and nurses are key healthcare facilitators in helping to achieve

MDGs 4 (reducing child mortality), 5 (improving maternal health) and 6 (combating HIV/AIDS, malaria and other diseases)(United Nations Population Fund, 2011). They provide care throughout pregnancy, during labour and after birth. Evidence has shown that, women who have received midwifery-led care were nearly eight times more likely to be attended at birth by a known midwife, were 21% less likely to lose their baby before 24 weeks, 19% less likely to have regional analgesia, 14% less likely to have instrumental birth, 18% less likely to have an episiotomy, and significantly more likely to have a spontaneous vaginal birth, initiate breastfeeding, and feel in control during childbirth (Maassen. M. S et al., 2008). Nurses and midwives achieve this by providing focused education on health promotion risk reduction behaviors, A more hands on approach with a closer supportive relationship with their provider during labor and birth, and fewer technological and invasive interventions(Oakley. D et al., 1995). In a study done in the United Kingdom on the efficacy of midwife-managed care from booking to discharged to the health worker visit, it showed that of the group of women that had midwife-managed care reported significantly greater satisfaction than those who received shared care. This was evidence not only overall but also for various specific features of satisfaction – choice, information, decision-making, and individualized care (Tumbuli. D et al., 1996). From this information it is therefore important that all the nurses and midwives have the competency to deal with MIP. The fact that there are only 28% of the required health workers in Gwembe district it is important that all health workers are competent. The low marks in the competencies can be attributed to lack of refresher trainings or task shifting as they may be carrying out other duties outside their scope of training and hence have forgotten what they were taught and trained to do.

The laboratory assistants in their overall score, scored below minimum competency level. They were in the lower range of those that did not meet the minimum competency level. If looked just at the overall results only it can lead to the conclusion that they are incompetent to do their work. But this is far from the truth, for their trained responsibilities are in laboratory test services, and for the competencies for laboratory services they scored full marks apart from one. This could be due to task shifting that goes on in areas that have less number of health workers needed. The competency they scored low marks in, is what is beyond their scope of training and job description e.g. management of adverse effect of treatment, management of malaria with patients that have other causes of morbidity, etc. A number of other cadres also scored high marks in laboratory test services, this can be accredited to the fact that when RDTs were introduced in health facilities, trainings were done and other cadres were trained as it can be done outside the laboratory settings (World Health Organisation, 2010).

The environmental health technicians also scored an overall score below the minimum competency level. Though they scored low in the overall marks, they scored high in some of the core competency in case management of MIP. They had high marks in the differentiating of simple from complicated malaria and also in the giving of medication. Out of 4 environmental health technicians, 2 scored high marks for management of drugs and diagnostics and 1 scored high marks in the management of patients with malaria that has other causes of morbidity. The reality is environmental health technicians are not trained in clinical medicine; their job description is mainly to identify, assess, treat and correct environmental problem. Due to the human resource for health crisis in Zambia as well as most developing countries, it has resulting in task shifting where health personnel start doing jobs they are not trained to do. Environmental health technicians are now involved in the case management of malaria and them scoring low

marks is worrying as they also provide treatment for simple malaria cases at the health center level together with nurses (Wallon. M et al., 2010).

When lowess was used it showed that competency level was related with years in service and age, as these had a pattern when plotted. These findings are similar to other studies that also found that years in service is related to competency and some studies have further tested and found that this relationship is inversely related. This meaning that the longer someone has worked the lower the competency. A systematic review: The Relationship between Clinical Experience and Quality of Health Care was conducted in 2005. In this study experience was correlated with age, 59 articles were reviewed and from the articles it was concluded that Physicians who have been in practice longer may be at risk for providing lower-quality care. Therefore, this sub- group of physicians may need quality improvement interventions(Choudhry. K. N et al., 2005). From figure 4, it can be seen that those who had worked for longer than 10 years on average did not have the competency. In figure 5, it also shows that those who were above 40 years of age did not have the competency. This can be credited to the fact the longer someone has worked they think they do not need to re-train in skills and knowledge they already know, forgetting that new techniques that are better are invented frequently and to remain relevant they need the competency. Some studies have also agreed with this by stating that physicians who have been in practice for more years may also be less likely to deliver high-quality care. Medical advances occur frequently, and the explicit knowledge that physicians possess may easily become out of date. Therefore, although it is generally assumed that the tacit knowledge and skills accumulated by physicians during years of practice lead to superior clinical abilities; it is also plausible that physicians with more experience may paradoxically be less likely to provide technically appropriate care(Hartz.A.J et al., 1999). The only case where

competency is directly related to years in service is when they consistently keeping up to date the changes that have occurred in their field of expertise.

The Kolmogorov-Smirnov test showed that age and competency score relationship was statistically significant and this is in agreement with a systematic review that was conducted on clinical competency and the aging surgeon. The article showed that 50% of the articles reviewed reported a decline in performance with increase in age, 21% showed a decline in some, but not all outcomes criteria(Stuart. A.G, 2008). When it came to competency score and years in service, the test showed that the relationship was not statistically significant. The reason for this may be due to the fact that the sample size was small and hence variation in the sample was less or not there at all and this is needed in regression.

The overall competency level of the different cadres has shown that majority of the health workers in Gwembe district have the competencies to handle cases of MIP. Malaria being the top causing morbidity and mortality in the district may contribute to the competency levels discovered, as they have frequent cases of malaria. The district has a reasonably high incidence of 599/1000 population in 2011, implying that interventions in the prevention of malaria has to be intensified to reduce the incidence level in the interim all the health workers that scored below the minimum competency level need to be trained so as to help fight malaria in the district. The overall level of competency means that they can contribute to the meeting of MDGs which are the reduction of infant mortality rate, improving maternal health by 75% and combating HIV/AIDS, Malaria and other diseases by 2015.

CHAPTER 6.0 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

This study has shown that most of the health workers have the competency to deal with malaria in pregnant women. Among the few that scored below the minimum competency level, some of them are critical as they are consistently in contact with pregnant women. This has also shown that measuring of competence is vital if the health of the population of the country is to improve and the meeting of the MDGs 4, 5 and 6 by 2015 as it bring to light what areas health workers need retraining or training and which areas we have the required competency.

To effectively improve the maternal health status and in turn help reduce maternal mortality rate in the district and the whole country at large, all the health workers have to be competent in their jobs and this can be accomplished by having routine competency assessment and from the results appropriate action can be taken.

6.2 RECOMMENDATIONS

1. In the view of the high prevalence of malaria in the district, training should be organized for the health workers who scored below the minimum competency level.
2. A similar study should be done but on a larger scale so as to have a more statistically acceptable inference of the findings to the general population and also be able to find out if years in service has a significant relation to competency score.
3. Looking at what the research has brought to light on the competency levels of the health workers in Gwembe district and how this can help improve the health care services, it is imperative that in all the remaining districts the same exercise should be carried out so

that the appropriate people can have evidence of the level of competency the health workers in the various districts have on diseases that are leading in the cause of mortality or morbidity, so that evidence-based decisions can be made to correct the situation.

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9.0 APPENDICES

9.1 LETTER OF ETHICAL APPROVAL

9.2 RESEARCH BUDGET

ITEM	UNIT COST (KR)	MULTIPLYING FACTOR	TOTAL COST (KR)
Stationery			
a) Reams of paper	25.00	25.00 x 3	75.00
b) Pens	0.50	0.50 x 10	5.00
c) Pencils	0.25	0.25 x 10	2.50
d) Staples	20.00	20.00 x 1 (Box)	20.00
e) Staplers	60.00	60.00 x 1	60.00
f) Calculators	75.00	75.00 x 1	75.00
Subtotal			237.50
Typing services			
a) Printer	750.00	750.00 x 1	750.00
b) Tonner	500.00	500.00x 3	1,500.00
c) Binding fee	10.00	10.00 x 20	200.00
d) Spirals	0.50	0.50 x 20	10.00
Subtotal			2460.00
Total			2697.50
Contingency (10%)			269.75
GRAND TOTAL			2967.25

9.3 GANTT CHART

NO	TASK TO BE FORMED	DATES	PERSONNEL ASSIGNED TO TASK
1	Finalizing proposal	January 2013	Researcher
2	Presentation of proposal to graduate forum	January 2013	Researcher
3	Submission of proposal to ethics committee	February 2013	Researcher
4	Coding of data (data entry)	October 2013	Researcher/Coder
5	Data analysis	October 2013	Researcher
6	Report writing	November 2013	Researcher
7	Submit draft report	February 2014	Researcher
8	Final report	April 2014	Researcher