FACTORS INFLUENCING PRESCRIBERS' ADHERENCE TO IMCI GUIDELINES IN THE MANAGEMENT OF PNEUMONIA AMONG THE UNDER FIVES: A CASE OF LINDI DISTRICT, TANZANIA

By

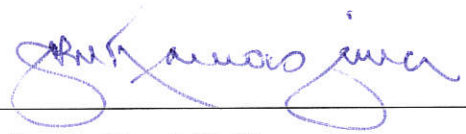
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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences

November, 2007.

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation titled: **Factors Influencing Prescribers' Adherence to IMCI Guidelines in the Management of Pneumonia among Under fives: A case of Lindi District, Tanzania**, in partial fulfillment of the requirements for the degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences.



Dr. Switbert R. Kamazima

(Supervisor)

Date Nov. 3rd 2007

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I, **Francis Menas Anga**, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for similar or any other degree award.

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ACKNOWLEDGEMENT

I would like to convey my sincere gratitude to the Ministry of Health and Social Welfare (MOHSW) for sponsorship, which enabled me to pursue the MPH course.

I wish to thank all members of academic staff of the School of Public Health and Social Science, Muhimbili University of Health and Allied Sciences, Dar es Salaam. It was from them that the foundation of this work grew.

I take this opportunity to express my sincere gratitude to my supervisor, Dr. S. R. Kamazima, for his interest and commitment in providing invaluable advice and guidance in writing this dissertation. I have benefited immensely from his constructive criticisms.

My heart felt thanks go to Dr. Seif Kungulwe the District Medical Officer of Lindi District for his assistance during data collection, Mr. Mussa Lazima, a Trained Nurse knowledgeable on IMCI who assisted in data collection and the prescribers of Rutamba Health Center and dispensaries for their co-operation.

Last but not least, I would like to convey my thanks to mothers and caretakers of the children who volunteered to participate in this study.

It was not possible to mention every individual who participated or facilitated this study. I say thanks to you all.

DEDICATION

This work is dedicated to my lovely wife Constance Anga, whose moral support was vital for me to accomplish my studies including this work, my sons Bertrand and Dennis Anga, my daughter Sarah Anga who missed my love during my absence.

I also dedicated this work to my lovely mother Xaveria Michael for her support and for giving me a good education foundation that brought me to where I am today.

ABSTRACT

The prevalence of ARI among the under fives is high (10-20%) ranking second to malaria in many developing countries. In Tanzania about 10.5% of the under fives attending health facilities present with ARI- related symptoms. In Lindi district, according to 2005 – 2006 health annual report the prevalence of ARI is 15%. Studies have associated the IMCI usage with improved quality care (Hadi, 2003; Tagreeds, et al; 2007) and lower under-five mortality levels of 13% in the IMCI practicing districts that had regular supportive supervision (MCE-Tanzania, 2006).

However, there are very few studies that have been conducted to determine factors which influence health workers' adherence to IMCI Guidelines in the management of pneumonia after training. Lindi district conducted IMCI training for its health workers in 2005. No supervision targeting IMCI has been conducted and no follow up study has been conducted to determine factors which influence health workers adherence to IMCI guidelines after training so that measures could be taken to reduce the ARI- related problems.

A cross sectional facility-based study was conducted in Lindi district from July to August 2007 to determine factors that influence prescribers' adherence to IMCI guidelines in the management of pneumonia among the under fives. The study involved 3 groups of participants.

The first group involved 192 under fives aged between 2-59 months from 16 health facilities who had acute respiratory infections and had come to the facilities for treatment. These were attended by the prescribers and, on coming out of the consultation room, the researcher/assistant reviewed the OPD treatment card and administered exit interviews to assess the management practices of the prescribers in the management of ARI-related conditions. The second group included 192 mother/caretakers who

answered questions from the questionnaires after coming out of the consultation room. The third group comprised of 16 prescribers selected from 16 health facilities. Each prescriber attended 12 under fives on the day of the study. A structured interview with the prescribers was conducted at the end of the working day to determine knowledge retention on IMCI guidelines in the management of pneumonia among the prescribers. A checklist was used to asses the availability of health systems support including antibiotics, IMCI guideline booklets, equipments and supportive supervision. Similarly, the researcher reviewed the OPD register at the end of the working day to document the number of patients attended by the prescribers, which reflected their workload.

Results from this study indicate that the prescribers' overall pneumonia management practices were poor. About 85.7% of the children presenting with cough, runny nose or cold were poorly managed at a level of performance of 14.3%. In addition, the overall knowledge retention of the prescribers on IMCI guideline was poor (37.25%). Further analysis of data showed the lack of the health systems support. About 68.8% of the health facilities, for instance, had no antibiotics for treating children with pneumonia. In addition, it was found no health facility had been supervised six months prior to the study. The mean workload of the prescribers was 28 patients on top of other duties.

It was concluded that poor pneumonia management practices are due to the lack of supervision, unplanned on-job training, heavy workload and the lack of antibiotics and other supplies. Similarly, lack of knowledge on the IMCI guidelines among the health workers, to a large extent, contributed to malpractices documented.

It was recommended that the District Council through CHMT should provide additional funds to be spent on health-related problems currently facing Lindi residents. These activities should include continuing (for the pre-service and in-service staff) health education and promotion trainings, on-job training programs, regular supervisory visits, improving the staffing level and for procurement and reliable supply of antibiotics.

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ABBREVIATIONS

AED	Automated External Defibrillator
AIDS	Acquired Immunodeficiency Syndrome
ARI	Acute Respiratory Infections
BHW	Basic Health Workers
BRAC	Bangladesh Rural Advancement Committee
CCHP	Council Comprehensive Health Plan
CE	Continuing Education
CHMT	Council Health Management Team
c-IMCI	Community Integrated Management of Childhood Illness
CPR	Cardio Pulmonary Resuscitation
DOTs	Direct Observable Treatments
HIV	Human Immunodeficiency Virus
HC	Health Center
IMCI	Integrated Management of Childhood Illness
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MoHSW	Ministry of Health and Social Welfare
MUCHS	Muhimbili University College of Health Sciences
NSGRP	National Strategy for Growth and Reduction of Poverty
OPD	Out Patient Department
PHC	Primary Health Care
TB	Tuberculosis
TDHS	Tanzania Demographic Health Survey
TEHIP	Tanzania Essential health Intervention Program
UK	United Kingdom
UNICEF	United Nations Children's Fund
WHO	World Health Organizations

CHAPTER ONE

INTRODUCTION

1.0. The background

About 10 million children in the developing countries die each year before they reach their fifth birthday due to several causes (Hadi, 2003). Five in 10 of these deaths are due to 5 conditions: pneumonia, diarrhea, malaria, measles and malnutrition (Hadi 2003, Chaudhary, 2005). These are preventable and treatable diseases through effective case management.

Acute respiratory infection (ARI) is a leading cause of mortality among the under fives in the developing countries (Pio, 2003). The World Health Organization (WHO) estimates that the annual number of ARI-related deaths in this age group is 2.1 million accounting for about 20% of all childhood deaths (Rudan, 2004). Pneumonia, an infection of the lung, is the most serious ARI-related condition and can be treated by antibiotics. The annual incidence of pneumonia among the under fives in the developing countries is 10-20%. However, incidences exceeding 50% have been observed in settings with high prevalence of malnutrition and HIV (Pio, 2003). Poverty, overcrowding, malnutrition, delayed and inappropriate case management including improper diagnosis are some of the reasons for high case fatality rates from ARI.

ARI cases reported in Tanzania since 1992 have been increasing from a baseline of 8%. In the following years of 2001, 2002 and 2003 the prevalence of ARI has been 21%, 19% and 18% respectively (Lorez, 2005). Therefore, pneumonia is a very serious disease among the children. In order to reduce its impact, some studies have suggested that interventions should emphasize on early diagnosis and treatment at lower level of health

care delivery such as dispensaries and health centers. In addition, it is very important for prescribers to recognize signs and symptoms such as a cough accompanied by rapid breathing, stridor or chest in-drawing to be able to diagnose and treat pneumonia accordingly.

Surveys on the management of sick children at the health facilities have shown that many cases of pneumonia among children are not properly assessed or treated and the parents/caretakers are poorly advised on the follow-up and proper management of mild-illnesses. Furthermore, diagnostic support such as radiology is minimal or unavailable, while the drugs and equipment needed for the diagnostic procedures are scarce.

Providing quality care to sick children under these conditions is a serious challenge. Responding to this challenge the WHO and UNICEF developed a strategy known as the Integrated Management of Childhood Illness (IMCI). The strategy combines the improved management of childhood illness with other measures like nutrition, immunization, the prevention of other child illnesses and disease and health promotion activities. The strategy has two main objectives: 1) to reduce the number of deaths and the frequency and severity of illness and disability; and 2) to improve performance of health workers in managing childhood illnesses for the improved growth and development (WHO/FCH/CAH.2004). These guidelines consist of user-friendly tasks to be performed by the health workers including comprehensive assessment of the child, classification of the child's conditions leading to treatment and advising mothers/caretakers on the need for follow-up. In the case of pneumonia, rapid breathing, presence of stridor and chest indrawing are major signs/symptoms used to detect pneumonia in the absence of a stethoscope or x-ray.

Over 80 countries have adopted IMCI and implementation involves three main components namely, improving the case management skills of health staff by providing

them with locally adapted guidelines on IMCI and through activities to promote their use, improving health systems and services required for effective management of child hood illness and improving family and community practices. The WHO's IMCI case management guidelines represent the "gold standard" for the facility-based care in countries where the major causes of under five deaths include pneumonia, diarrhea, measles, malaria and malnutrition (Bryce, et al, 2005).

To assist countries in introducing the first component – improving health workers' skills – WHO and UNICEF developed an approach that includes initial skills acquisition through an in-service training course and skills reinforcement through supervision visits. The supervision visit is intended to reinforce the new skills and help health workers to apply the knowledge and skills learnt in their health facilities.

Applying and maintaining the IMCI approach by health workers ` presents many challenges. For example, the work environment of health workers is often very different from the setting in which the training is organized. There is lack of materials like weighing scales, thermometers and drugs. Therefore, supportive supervision is required to enable health care providers to put their knowledge and skills into practice (Chaudhary, et al, 2005).

WHO followed the guidelines to develop generic training courses that have been implemented in all countries with IMCI programs. The training emphasizes supervised clinical practice and recommends that each participant receive a follow-up visit from their trainer 4 to 6 weeks after the initial training in order to reinforce their new skills (Bryce, et al, 2005).

Similarly, the guidelines emphasize giving the child the first dose of an antibiotic and then refer the child to a hospital in case of very severe pneumonia. In case pneumonia is

not severe, the health worker should give antibiotics to the child to be taken at home and should ask the mother/caretaker to bring the child to the health facility on the third day for check-up. In addition, the mother/caretaker should be asked to bring the child to the facility immediately if the condition of the child gets worse. In case the child has no pneumonia, he/she is given a safe remedy and has to come back on the fifth day for control. If the cough persists for thirty days, the child should be referred to a hospital for further management.

1.1. IMCI implementation in Tanzania

Tanzania adopted IMCI initiative in 1996. The main aim was to reduce the prevalence of treatable and preventable diseases with the ultimate goal of reducing mortality and morbidity of under fives in Tanzania. Morogoro Rural, Magu, Muheza, Igunga, Mpwapwa, Korogwe and Rufiji districts were selected to be the pilot districts. The programme was later expanded in 2003 to other regions and training institutions. Currently (2007), many districts are at different stages of the implementation and have included IMCI in their Comprehensive Council Health Plans (CCHP).

Teaching schedules range from 11 to 15 days for in-service health workers (MCE-2004). Training is thus conducted under different schedules, some for 11 days and others for 15 days. The field tests of IMCI training course with community health workers such as clinical officers, rural medical aids and maternal and child health aides in Tanzania has shown that participants needed extra facilitation to learn the required skills (Chaudhary et al, 2005). All Assistant Medical Officers' Schools, Clinical Officers' Training Centres and Nursing Schools provide IMCI as pre-service training. Training is conducted in English combined with Kiswahili for in-service training. The use of different training schedules and languages may lead to different understanding and level of performance.

Lindi District conducted IMCI in-service training in 2005 and 2006 involving 16 health workers each year. Currently (2007), Lindi district has 32 health workers trained on IMCI. Pre-service training is being conducted at the Clinical Officers' Training Center, Lindi Regional Hospital. However, not all the graduates are employed in Lindi district because job appointments for the graduates are managed by the Ministry of Health and Social Welfare (MoHSW); not the Lindi District authorities. Community IMCI has not started in Lindi district due to the lack of funds. Lindi District Council is responsible for setting aside funds in its CCHP so that training of health workers and the community could start. Community IMCI (c-IMCI) trains the community and family members to manage sick children at home (the safe remedy medication) as a first step before sending them to the health facility. IMCI in Lindi district is, therefore, still facility-based and this has implications to the health status of the under fives. As a result, sick children are sent to health facilities without first aid measures at home, which contributes to high morbidity and mortality rates recorded at the district level.

1.2. Problem statement

The prevalence of ARI among the under fives ranks second to malaria in many developing countries. In Tanzania, 10.5% of under-fives attending health facilities present symptoms of ARI. In Lindi District, according to the 2005-2006 health annual report, the prevalence of ARI was 15%. One of the interventions to reduce under-five mortality is the training of facility health workers on IMCI guidelines. Studies have associated the IMCI usage with improved quality care (Hadi, 2003; Tagreeds, et al; 2007) and lower under-five mortality levels of 13% in the IMCI practicing districts that had regular supportive supervision (MCE-Tanzania, 2006).

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Nevertheless, very few studies have been conducted to determine factors, which influence health workers' adherence to IMCI guidelines. Lindi District conducted IMCI training for health workers 2 years ago (beginning in 2005) and no refresher training or supervision targeting IMCI has been conducted. Similarly, no follow up study has been conducted to determine factors, which influence health workers' adherence to IMCI guidelines after training. With this scenario, it is crucial that a study should be conducted to determine factors that influence prescribers' adherence to the IMCI guidelines in the management of pneumonia among children in Lindi district so that measures could be undertaken to reduce the ARI-related problems.

1.3. The Rationale of the Study

Proper management of children with pneumonia using IMCI guidelines is determined by many factors. Some of the factors include proper management practices, proper knowledge on the management of pneumonia among the prescribers and the availability of supportive health systems. The understanding of some factors that influence prescribers' adherence to IMCI guidelines in the management of pneumonia in the under fives is scarce. Furthermore, few studies that have been conducted (in Bangladesh, Kenya and Tanzania, for instance) focused on knowledge retention and management practices of health workers after IMCI training had discrepancies. Other factors such as health systems support were not part of the study. Factors, which influence prescribers' adherence to IMCI guidelines in managing children with pneumonia, need to be updated. Therefore, this study attempted to generate more information that would provide evidence-based planning of further pre-service and in-service trainings for the health workers on the management of pneumonia among the under fives not only in Lindi district but in Tanzania in general.

1.4. Research Questions

This study attempted to answer two key questions:

1. To what extent do the prescribers retain and appropriately use the knowledge gained from IMCI training on the management of pneumonia among the under fives?
2. How does the health system (supportive supervision, workload, supplies, IMCI materials and antibiotics) support or limit the prescribers' ability to adhere to the IMCI guidelines when managing pneumonia among the under fives?

1.5. The study objectives

The broad objective of this study was to establish factors that influence health workers' adherence to IMCI guidelines for the management of pneumonia among the under fives.

1.6. Specific Objectives.

This study fulfilled the following specific objective:

1. To assess the prescribers' knowledge on IMCI algorithm for the management of "severe pneumonia" or "very severe disease", "pneumonia" and "no pneumonia" conditions.
2. To determine how the availability or lack of health systems support (supportive supervision, IMCI guideline materials, thermometers, weighing scales and antibiotics) influence pneumonia management among the under fives.
3. To determine how the prescribers' working environment and workload influence the adherence to IMCI guidelines in managing pneumonia among the under fives.
4. To document prescribers' practices regarding pneumonia management among the under fives and to recommend some measures to reduce the malpractices documented.

CHAPTER TWO

LITERATURE REVIEW

Tanzania is committed to provide quality health services to its 36 million people as one of the strategies for poverty reduction. This is in accordance with the National Strategy for Growth and Reduction of Poverty (NSGRP) cluster number 2, which states "to improve the quality of life and social well being of all Tanzanians" and goal number 2 of the same cluster stating: "to improve survival, health and well being of all children". (NSGRP, 2005). This commitment is also in line with the Millennium Development Goals of 2000. Goal 4 states: to reduce child mortality; and target 5 states: "to reduce by 2/3 between 1990 and 2015 the under five-mortality rate" (MDGs, 2000).

In order to accomplish these goals and targets, the Tanzanian government has conducted, and is still conducting, various training programs to health workers so as to equip them with knowledge and skills that will enable them render quality health care services. Some of the training programs conducted by the government focused on HIV/AIDS, STI, TB, Leprosy and IMCI. Each of these training programs has guidelines developed by the governments, which have to be adhered to by health workers when delivering services to clients and the community. Examples of these guidelines are the Direct Observable Treatment (DOTs) for tuberculosis (TB), malaria treatment guidelines and the IMCI guidelines.

A group of physicians conducted a survey to determine knowledge retention and performance of a sample of 120 community health workers in 10 sub-districts of Bangladesh where the Bangladesh Rural Advancement Committee (BRAC) had run a community based ARI control programme since the mid-1992. The community health workers were given a 3 day intensive training programme, which included basic anatomy

and physiology of respiratory organs, classification of ARI sign and symptoms of pneumonia, examination of pneumonia cases by counting respiration rate, advice on patient care referral, target group identification and record keeping. The medium experience time of the community health workers was 64.5 months. Overall, 72.5% of the community health workers were routinely supervised. Structured interview, observation of their performance and re-examination of the children by the physician were the tools used to evaluate the community health workers' performance. Significant differences in diagnosis were observed between the community health workers and the research physician. The community health workers identified 18.9% of children as having ARI of any kind while the physician identified 22.0% of the children. These differences suggested that the community health workers tended to mis-diagnose potential cases.

The overlap between community health workers and research physicians for different classification suggests that the correct diagnosis of ARI by community health workers was 12.5% "for very severe" cases and 45.8% for "severe cases". Overlap was observed for 65.5% mild cases. During this research, however, the presence of the research physician observing the performance of health workers in the consultation rooms may have encouraged the health workers to be more careful when making diagnosis and treatment decisions. As a result, their performance might be slightly better than usual (Hadi 2003). In this sense, routine and regular supervision by IMCI focal persons or any other member of the health system knowledgeable on IMCI is very important for the management of pneumonia among the under fives.

Another study was conducted at the Soroka Medical Center in Israel to assess the knowledge of basic epidemiology and research methods involving 219 health workers who had undergone a training 5-8 years ago. Structured interview on basic knowledge in epidemiology and medical statistics were given to them. The study reported a low level

of knowledge on basic epidemiology and medical statistics. The median score was 40% (Novack, et al, 2006). In this study it was also reported that health workers who had the habit of reading publications as a continuing education activity and having discussions with other prescribers scored higher than those who did not. This finding suggests that continuing education (CE) on the use of IMCI guidelines, reading habits and discussions among health workers on the management of pneumonia among the under fives are important and should be encouraged.

In order to determine the capacity constraints to the adaptation of new interventions according to the IMCI guidelines in Brazil, a study was conducted to investigate the amount of time required to provide clinical care to the under fives based on IMCI protocol compared to the routine care. The IMCI-trained providers spent 1 minute and 26 seconds longer per consultation with under fives than untrained health care providers. The difference was greater when the number of patients was low and decreased as the number of patients a provider attended per day increased. It was concluded that in areas where the health care providers experience heavy workload, it is less likely for the prescribers to adhere to IMCI guidelines (Tagheed, et al, 2005).

Another study was conducted in Western Province of Kenya by Odhacha, et al (1998). The study reported that prescribers spent 8 minutes and 30 seconds with children with a mean workload of 29 patients per shift. A period of 8 minutes and 30 seconds was not adequate for following the IMCI algorithm chart. A minimum of 20 minutes is required per each consultation (Gowele 2004). The findings suggest that the prescribers do not spend required time when attending sick children including those suffering from pneumonia.

In order to assess family planning service delivery skills in Kenya, a study was conducted to evaluate knowledge retention and technical competence of two cohorts of family

planning service providers trained with a new curriculum. One cohort had just finished training within two months before the study. The other cohort was the first group trained with the new curriculum one year before the study. Observation of performance and structured interviewing were used in this evaluation. Results showed that both cohorts did not differ in scores. These findings suggested that continuous use of skills learnt in training is more predictive of knowledge and skill retention than time elapsed since training (Valadez, et al, 1997). The study concluded that the health workers should be facilitated and motivated to continue using the acquired skills any time they attend the under fives. This can be achieved if the health workers are supervised regularly and their performance properly evaluated.

As part of the activities to strengthen family planning training and improve the quality of family planning in the country, Turkey conducted the on-job training visits to 16 clinics between 1995 and 1998. The objectives of this training were: 1) to refresh and improve family planning skills, and 2) to find out whether the National Family Planning Guidelines set by the Ministry of Health are adhered to. Methods used were structured observations via checklists and self-assessment. None of the service providers was found to have adequate skills during the first visit. On the fifth visit, all (100%) service providers were found to have the required skills. The study concluded that the ultimate success of the family planning programme depended on structured and well supervised on- job training accompanied with follow up visits to the sites (Ozek, et al, 1998).

India conducted a study to assess the rÿÿenÿÿon of knowledgÿÿand skills learnt by health workers 4-8 weeks and one year after IMCI training. Record review, case observation, re-examination of the patient by the physician, physical verification of supplies using a checklist and structured interview to health workers were used to capture the required information. Knowledge retention and performance was better for health workers who were followed up and assessed 4-8 weeks after training (83.8%) compared to those

followed up and assessed one year after training (47.9%). The study concluded that early follow up after training and the availability of supplies were essential for the retention of knowledge and the application of skills acquired by the health workers (Chaudhary, et al, 2005).

Another study was conducted at the James Cook University Hospital, UK, by observing performance and then interviewing trainees who had undertaken initial training and the first refresher training at intervals of 7 months and 1 year. Greater loss of knowledge had occurred when the second refresher training was undertaken after 1 year compared with 7 months (Woollard, 2006). It was concluded that refresher training for basic health workers is essential and should be planned for within six months after the training.

Retention of knowledge and skills proficiency was evaluated after two years of training among the emergency care workers in Texas, U.S.A., using performance observation and interviewing. The average loss of knowledge was 55% for Emergency Care Attendants, 50% among Emergency Medical Technicians and 65% among Emergency Paramedical (Latman, 2004). This study recommended supportive supervision as a key factor to improve knowledge and skill proficiency and should be planned for and implemented as a key part of the whole program.

A study conducted in Gezira State, Sudan, by WHO in 2000, on maintaining health workers' knowledge and performance with follow up after training. Out of the 46 health workers trained on IMCI in two districts, 36 were followed up. The follow up took place 6-8 weeks after training. The results showed marked improvement in health workers knowledge and performance. The health workers used the IMCI algorithm as recommended by WHO, recorded children's weight, checked for danger signs, examined children's nutritional and vaccination status and gave pre-referral drugs and advice to the mothers/caretakers. The health workers were more interested and motivated. It was

concluded that in order to maintain the level of knowledge and performance, frequent follow-up visit at least every 3 months during the first year are needed. Similarly, the study suggested that feedback from the supervisory authorities to the lower levels was equally important for keeping the health workers motivated.

In an evaluative supervision of IMCI in Madagascar, a review of the implementation process was conducted by WHO in 2000. A total of 105 out of 722 health workers were trained on IMCI. One member from 19 out of 21 CHMT was trained to act as an IMCI focal person. Supervision visits were conducted for 3 to 15 months after the health workers had completed their IMCI training. The supervisors directly observed 13 health workers as they managed 125 sick children. Observation results showed that 73% of the children received correct treatment and 98% were checked for general danger signs. The assessment of the health systems support indicated that only 6 out of 23 health facilities had the basic drugs needed for IMCI. It was concluded that supportive supervision and reliable supply of drugs and other equipment were important for the success of the IMCI programs.

The review of literature available provides four key points that are important for this study. 1) Follow-up of IMCI trained health workers has to be conducted 4-6 weeks after training. Thereafter, supportive supervision, on-job training and observation of pneumonia management practices have to be conducted regularly. 2) Continued education through refresher courses, reading professional publications and professional discussions among the health workers are equally important for the success of the IMCI programs. 3) The workload shouldered by health workers due to lack of qualified staff greatly contributes to the poor pneumonia management practices. Whenever there was less workload, the health workers used IMCI guidelines and spent required time attending children with pneumonia-related problems. And, 4) the lack of drugs and other equipment needed for pneumonia management among the under fives limits the prescribers'

adherence to the IMCI guidelines. The factors which influence prescribers' adherence to IMCI Guidelines in the management of children with ARI-related problems need to be updated. The study therefore tried to get more information that would bring evidence-based planning for further health workers training on the management of ARI-related illnesses in Lindi and Tanzania as a whole. The following chapter presents the methodology used to generate information needed to answer the stated research questions.

CHAPTER THREE
METHODOLOGY

3.0. Description of the study area

The study was conducted in Lindi District, Lindi Region, on the South Eastern part of Tanzania. Lindi region has five districts namely, Lindi, Kilwa, Ruangwa, Nachingwea and Liwale. The major tribes are Wamwera, Wamatumbi, Wangindo and Wamachinga. The District has a total population of 240,508 (National Census, 2002) and an area of 5,558 square kilometers. The district is located between 7^0 30" N and 5^0 25" S and between 38^0 45" Wand 39^0 30" E. It shares borders with the Indian Ocean in the East, Kilwa and Ruangwa district in the North, Tandahimba and Masasi Districts in the West and Mtwara District in the South.

Lindi experiences two climatic seasons: 1) a rainy season which starts from November to May, and 2) the dry season from June to October. The average rainfall is about 800–1000 mm per annum. The rainfall distribution, however, is not very reliable. It is hot throughout the year with average temperature of 30^0 C. The district has two major agro-ecological zones, which differ due to landforms as well as soil classification. These zones are the costal belt and the uplands. The district has a total of 41 health facilities: one hospital owned by the Roman Catholic Church); 5 health centers (of which 4 are public and one owned by the Roman Catholic Church) and 35 dispensaries (of which 33 are public and two are owned by the Roman Catholic Church).

The population of under fives in Lindi district is 48,102 and the prevalence of ARI is 15%. ARI is the second among the top ten diseases treated at the out patient department. Lindi district ranks second in the country having a high rate of under five mortality of

220/1000 compared to the first district, Ruangwa (in the same region) that has mortality rate of 250/1000 (TDHS 2004).

3.1. Study population

The study population included all children who came to the health facilities on the day of the study presenting with cough, cold or runny nose. Similarly, mothers/caretakers who brought their children to the health facilities studied were targeted by this study. Finally, prescribers who had received training on IMCI and were at work on the day of the study were targeted.

3.2. Study design, sampling techniques and sample size

This was a cross–sectional facility-based study conducted in 16 health facilities in Lindi district. There were 32 prescribers in total who were trained on IMCI in 2005 and 2006, one prescriber from one of the 5 HCs and 31 from the dispensaries. For convenience 16 prescribers out of 32 were selected for the study, one from the health centre and the remaining 15 prescribers were obtained from dispensaries picked randomly from a list of all dispensaries in the district. Names of all dispensaries were written on pieces of paper, folded and put in a box. After shaking the box, the researcher picked and recorded the first dispensary. To allow equal chances for each dispensary to be selected, the name of the dispensary picked was put back in the box ready to pick the second dispensary. The process continued that way until 15 dispensaries were selected. The study was conducted by the principal investigator and one research assistant.

The sample size of the under fives presenting cough, cold or runny nose at the OPD or MCH clinic who were recruited in the study were determined using the proportional formula:

$$n = \frac{z^2 p (100-p)}{E^2}$$

Where,

n = the desired sample size

z = percentage of Standard Normal Distribution corresponding to 95% Confidence Interval which is 1.96

p = the estimated proportion or prevalence of ARI in under fives which is about 15% in Lindi district.

E = margin of error of p which is 5%

Therefore, $n = \frac{1.96^2 * 15 (100-15)}{5^2}$

$$= \frac{3.8416*15*85}{25} = 192$$

The total number of prescribers who participated in the study was 16. Since the number of children was192 each of the16 prescribers served 12 children presenting with cough, cold, or runny nose. The researcher used his medical experience to determine that the child has the said condition. A child in the queue presenting with cough, cold or runny nose was picked up until 12 children were obtained. In case there were less than 12 eligible children for the study, the researcher revisited the health facility on the following day. However, the researcher took all measures to exclude children who were selected on the previous day.

3.3. Data Collection Methods

A combination of methods was used to determine the prescribers' management of ARI cases: exit interviewing, prescriber interviewing, IMCI materials checklist, and documentation.

1. *Exit interviewing*: the principal investigator went around the (MCH) and outpatient department (OPD) and asked each mother/caretaker the problems of his/her child. Children presenting with cough, cold or runny nose were identified, and depending on how they were seated in the queue, every second child with cough, cold or runny nose was selected and given a colored piece of paper numbered 1, 2, 3.... up to 12. The numbers were meant to remind the investigator of the patients involved in the study.

The mothers/caretakers then went into the consultation room one at a time. After the patient had come out of the consultation room the principal investigator reviewed the OPD card of the child in the dispensing room before the drugs were given to the child. They recorded the identity number and conducted the exit interview with the mother/caretaker. There were 13 questions and according to scale used by Gowele's study in 2004, marks were given for the responses as narrated by the mother/caretaker. Results were categorized as: "Excellent" for recording 75% or more of the appropriate clinical findings relevant for the management practices of a child with pneumonia on the OPD card; "Good" for recording 50-74% of the appropriate clinical findings relevant for the management practices of a child with pneumonia; and "Poor" for the score less than 50%.

2. *Prescriber interviewing:* The assessment of human competence as it is used today in schools and work places is systematically based on the numerical evaluation of some aptitude (Falmagme, 2004). Therefore, measuring the physical or mental faculties of human beings, in this case, the prescribers, by numerical values enable a short hand description of an individual by measuring a small sample of his/her dimensions and qualities. This sufficiently defines his/her keenness of sense and mental character and constitutes concise and exact numerical values. Thus real numbers such as scores are still used and are valid to represent quality of attribute.

There are various methods of measuring individual or group knowledge assessment.

According to Leshabari (2007), objective tests are the most commonly used. They usually involve use of yes/no, true/false type of questions. Scoring of responses is fairly objective in the sense that any one conversant with the subject matter will agree on the correct answers. The limitations of this format are the inability to measure the deeper knowledge of the individual. The other alternative is using interviewing method for generating the same information and scores are accorded accordingly. The investigator decides on the cut off point reflecting different levels of knowledge measured (Leshabari 2007). In this study, knowledge assessment was conducted using a questionnaire.

After the prescriber had attended the patients, the principal investigator interviewed him/her on basics of IMCI guidelines as set by WHO. The questionnaires also contained questions on standard steps set by WHO, which the prescriber had to follow in managing children with pneumonia that is, history taking, physical examination, to classify pneumonia and treatment, referral and giving advice to the mother/caretaker on the child's health care. Poor response by the prescriber to these questions meant that he/she had not retained what he/she was trained on 1-2 years ago.

Knowledge was assessed by using a questionnaire consisting 11 questions. One point was awarded for each correct response. According to scale used by Gowele's study (2004), one point was accorded for the correct answer, otherwise he/she scored zero. For example, if the total correct points were 6, it was divided by 12 and multiplied by 100. The score was 50%. The results were categorized as: "Excellent" for scoring 75% or more of the appropriate clinical findings relevant for the management practices of a child with pneumonia on the OPD card; "Good" for scoring 50-74% of the appropriate clinical findings relevant for the management practices of a child with pneumonia; and "Poor" for the score less than 50%. Similarly, the prescriber was asked when supervision aiming at IMCI was last conducted in his/her health facility.

3. *Checklist for IMCI materials*: the research assistant asked and check for the presence/absence of IMCI materials such as IMCI algorithm, flow charts in the prescriber's room and the availability of antibiotics for managing children with pneumonia, weighing scales and thermometers. The presences or absence of these materials suggested how the health system influences the prescribers' adherence to IMCI guideline.

4. *Documentation*: in order to determine the workload shouldered by the prescribers involved in the study, the research assistant checked the OPD register and recorded the total number of patients attended by the respective prescriber on the day of the study.

3.4. Data Analysis

Data were entered into EPI Info computer programme for processing and analysis. The qualitative and quantitative data were organized in frequency tabulation as presented in chapter four.

3.5. Ethical Issues

The ethical clearance and permission to conduct the study was obtained from the Directorate of Research and Publications of the Muhimbili University of Health and Allied Sciences (MUHAS). In the field, permission to conduct the study was obtained from Lindi District Medical Officer. The in-charges of the health facilities were consulted and informed of the objectives of the study. Permission to conduct the study was finally granted. Experience has shown that most of the Tanzanians, particularly in the rural areas, prefer providing verbal consent rather than written consent. Hence, mothers/caretakers, who were included in the study, provided a verbal consent for their participation.

In order to get unbiased results that reflect the real working situation in the health facilities, the prescribers were not interrupted in the consultation room when attending the patients. This attempt solved the problem faced in a study conducted in Bangladesh by Hadi (2003), where the presence of research physicians observing the performance of prescribers in the consultation rooms encouraged the prescribers to be more careful when managing children with ARI and their performance was better than usual.

3.6. Limitations encountered and their solutions

1. The study did not involve direct observation of the prescriber's performance. Instead, the study was based on interpersonal aspect of quality through patient records in the OPD card and exit interviews of the mothers/caretakers.

2. The study could not assess the outcome, that is, the change of health status after receiving health care; patients' records and answers from the mother/caretaker were used to measure the outcome aspect of quality of health care services.

CHAPTER FOUR
RESULTS

4.0. Some demographic characteristics of the study participants

Table I shows the age distribution and sex of the under fives and the prescribers. Seventy seven children (40.1%) were in the age group of 12–23 months followed by age groups 0–11 and 24–35, with 43 (22.3%) children in each group. Similarly, four prescribers (25%) were in the age group 25-29 and 40-44 followed by age group 35-39, 3 (18%).

Table I: Socio-demographic characteristic of study respondents (n=192)

Under fives (n=192)			**Prescribers (n=16)**		
Age (months)	Freq	%	Years	Freq	%
0-11	43	22.3	25-29	4	25
12-23	77	40.1	30-34	2	12.5
24-35	43	22.3	35-39	3	18.8
36-44	15	7.8	40-44	4	25
45-59	14	7.2	45-49	1	6.3
			50-54	2	12.5
Sex			sex		
Male	91	47.3	Male	13	81.3
Female	101	52.7	Female	3	18.7

Only one prescriber was in the age group of 45-49 years. The majority of the prescribers interviewed were clinical officers 12 (75%), assistant clinical officers 2 (12.5%) and nurse mid wife 2 (12.5%). Thirteen prescribers were men and three were females.

4.1. Prescribers' pneumonia management practices:

Management practices of the prescribers were assessed using questionnaires administered to the mothers/caretakers and the review of the OPD cards. A summary of the results on prescribers' pneumonia management practices on the day of the study is presented in Table 2. Generally, findings showed poor case management practices except for body weight checking, which was recorded for 180 (93.8%) children and non-use of a stethoscope 172 (89.6%). Many children 179 (93.2%) were attended without proper history taking of the illness, such as main complaints, duration of the complaints, elaboration of the complaints, past medical history, family history and immunization status of the children. The prescribers took the proper history of the illnesses for only 13 (6.8%) children included in this study. The majority of the children, 152 (97.2%) were equally not examined clinically. For example, the prescribers did not conduct procedures for checking the conjunctiva and nail bed for pallor, cervical lymph node palpation or abdominal palpation procedures were not conducted.

Table 2: Documented pneumonia management practices (n=192

	Correctly managed	
Management Practices	**Freq**	**Percent**
History taking	13	6.8
Physical examination	40	20.8
Non-use of a stethoscope	172	89.6
General danger signs documented	55	28.6
Respiration rate documented	52	27.1
Stridor documented	4	2.1
Chest in drawing documented	29	15.1
Pneumonia correctly classified	35	18.2
Pneumonia correctly treated	33	17.2
Gave antibiotics with indication	43	42.6
Gave advice to mothers/caretakers	10	5.2
Body temperature taken	42	21.9
Gave antibiotic without indication	58	57.4
Body weight checked	180	93.8

Similarly, among 172 (89.6%) children attended, the prescribers did not use a stethoscope in diagnosing pneumonia which is good and recommended practice. There was no

documentation of any general danger signs for 137 (71.4%) children. Likewise, the presence or absence of stridor and chest in drawing were documented for only 4 (2.1%) and 29 (15.1%) children respectively.

According to the IMCI Guidelines, pneumonia should be classified as either "severe pneumonia", "pneumonia" and "no pneumonia." Taking this into account, 157 (81.8%) children were not correctly classified. The children were labeled having pneumonia without any clinical support. Only 35 (18.2%) of the children were correctly classified and about 33 (17.2%) children were correctly treated.

Similarly, 58 (30.2%) children who had no indication for antibiotic treatment were given antibiotics. However, only 43 children (22.7%) of those who did not need antibiotics were not given antibiotics; which was a good and recommended practice. The body temperature was not taken and recorded for 150 (78.1%) children as compared to only 42 (21.9%) children whose body temperature was taken. Furthermore, IMCI Guidelines emphasize that mothers/caretakers should be given advice on follow- up. In this study, only 10 (5.2%) mothers/caretakers were given advice on follow-up plans. The overall score of children "excellently" managed by the prescribers for more than 75% aggregate was 28 (14.3%), "good" score for management practice of 50-74% aggregate was 0 while 'poor' management practice of less than 50% was 164 (85.7%).

4.2. Prescribers' retention of knowledge on IMCI guideline

Results on the knowledge retained by the prescribers (Table 3) show that 10 (62.5%) out of 16 could mention the 3 danger signs of a very sick child and pneumonia classification according to the IMCI Guidelines. Similarly, only 9 (56.3%) prescribers remembered the criteria for referrals and follow up of patient with cough but not pneumonia. Eight prescribers (50%) remembered the need for follow-up of a patient with pneumonia. Seven prescribers reported that they remembered the important signs of pneumonia as presented in the IMCI guidelines.

Three prescribers could report good management of pneumonia and its signs among children aged 2-59 months. Two prescribers had knowledge on the management of severe pneumonia. Five (31.25%) scored 50-74% or "good" and 1 (68.75%) of them scored below 50% or "poorly."

Table 3: Prescribers knowledge on IMCI guideline (n=16)

Knowledge assessment questions	Correctly answered Freq	percent
The 3 important general danger signs	10	62.5
Signs in a child aged 2-12 months for diagnosing pneumonia	3	18.8
Signs in a child aged 12-59 months for diagnosing pneumonia	3	18.8
Classification of pneumonia as per IMCI guidelines	10	62.5
Important sign of "severe pneumonia"	7	43.8
Important signs of "pneumonia"	8	50
Criteria for referral of child with pneumonia	9	56.3
Management of "severe pneumonia"	2	12.5
Management of "pneumonia"	3	18.8
Management of cough but no pneumonia	2	12.5
Follow up of a patient with pneumonia	8	50
Follow up of a patient with cough but pneumonia	9	56.3

4.3. Problems associated with IMCI usage

A questionnaire was administered to each prescriber to document the perceived and actual problem related to IMCI guidelines usage in the management of pneumonia among the under fives. One of the questions required the prescribers to explain in what situations

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do they use the IMCI guidelines in the management of pneumonia. Results (Table 4), show that the majority, 9 (56.3%) reported to use the IMCI guidelines when there were few patients to attend; 4 (25%) claimed to use it any moment the child was brought before them for treatment. The other 3 stated that they rarely use the guidelines because they are experienced.

Table 4: Likelihood of IMCI guideline usage.

Time IMCI guidelines are used	freq	percent
All the time	4	25
When there are few patients	9	56.3
Rarely	3	18.7
Total	16	100

Another question asked the prescribers to mention some of the problems encountered when using the IMCI guidelines. Results indicate that half of the prescribers, 8 (50%) avoided using IMCI guidelines because it requires longer time to attend one patient in an OPD which is often full of other patients. The other 6 (37.5%) prescribers said that irregular supplies of drugs and other equipment restricted them from adhering to the IMCI guidelines in treating pneumonia.

4.4. Prescribers' workload

This study assessed the workload shouldered by the prescribers. Results show that the range of patients per working day was 12-50. However, the majority of the prescribers reported to attend between 22 and 30 children a day. On the average the number of patients attended by the prescribers on the day of study was 28. The accepted workload for prescribers is 24 patients per day. Observation data collected from the facilities indicate that the prescribers did not attend children only. They also attended adult patients and spent time performing surgical procedures such as stitching of cut wounds, incisions, and drainage of abscesses. This suggested that the prescribers were overloaded.

4.5. Health support system for IMCI programs

The other objective of this study was to document the presence or absence of materials and equipment required for the implementation of the IMCI guidelines. The materials checked included antibiotics, weighing scales, thermometers, IMCI booklets, supportive supervision and feed back from immediate and higher levels of supervision.

As shown in Table 5 antibiotics were lacking in 68.8% of the health facilities during this study. The prescribers reported this situation to make the management of children with pneumonia very difficult. However, weighing scales and thermometers were available in most of the health facilities (93.8% and 81.2% respectively).

Table 5: **Health systems support (n=16)**

Health systems support material	**available**		**not available**	
	No.	%	No	%
Antibiotics for treatment of pneumonia	5	31.2	11	68.8
Weighing scales	15	93.8	1	6.2
IMCI guideline booklets	14	87.5	2	12.5
IMCI guideline booklets shown	12	75	4	25
Thermometers	13	81.2	3	18.8
Supportive supervision for the past 6 months	0	0	16	100

The IMCI guidelines (booklets) were reported to be available at 14 (87.5%) health facilities. Twelve 12 of the 14 facilities presented the IMCI guidelines (booklets) to the researcher/research assistant for verification. None of the health facility had been supervised for the last six months.

CHAPTER FIVE

DISCUSSION

5.0. This study determined factors that influence prescribers' adherence to IMCI Guidelines in the management of pneumonia among the under fives in Lindi district. This chapter presents the study findings in the global and Tanzanian contexts.

5.1. Prescribers' pneumonia management practices

This study could not establish any socio-demographic factor like sex or initial training on IMCI to be key factors in determining the prescribers' ability to adhere to IMCI guidelines. The overall score on the management practices was poor. Factors like lack of comprehensive (initial) training, unplanned on the job-training programs, lack of supportive supervision and irregular supplies of antibiotics and other equipment limited the prescribers' performance in managing pneumonia among the under fives.

These results are similar to Odhacha's observations in Kenya (1998) where the level of proper management practices in classifying pneumonia was only 31% and the level of correct treatment was only 32%. Similar findings were also observed in Bangladesh by Hadi (2003), where only 30% of the community health workers classified pneumonia correctly. It should be noted, however, that the high levels of performance might have been influenced by the presence of the supervisors in the examination rooms.

The findings from this study differ from results recorded in by Brycle, et al (2000) in Morogoro and Rufiji, where the levels of correct classification and treatment of pneumonia were 63% and 75% respectively. This difference could be explained as follows. First, Morogoro and Rufiji Districts were the pilot districts in assessing management practices one year after IMCI training. The health workers involved in the study were informed about the evaluation of their practices, which could have influenced their performance. Second, these districts are under Tanzania Essential Health Intervention Package (TEHIP) "cascade" type of supervision, which does not include Lindi District. Third, the two districts have several NGOs providing financial support for transport for regular supervision and supplies distribution compared to Lindi district.

5.2. Prescribers' retention of knowledge on IMCI guidelines.

This study found that the prescribers had poor knowledge in several items asked. Out of the 16 prescribers interviewed, only 3 (18.8%) knew the signs, which have to be elicited in a child age 2-12 months and 12 – 59 months, for diagnosing pneumonia. Similarly, there was poor knowledge on the important signs of "severe pneumonia" or "very severe disease" 7 (43.8%), management of "pneumonia", as well as management of "cough but no pneumonia" 2 (12.5%). The overall knowledge retention of knowledge on IMCI guidelines among the prescribers was 5 (31.25%). Hadi (2003) made a similar

observation in Bangladesh, where the overall retention of knowledge was only 18.95%. Similarly, a study by Novack, et al (2006) in Israel found knowledge retention among health workers to be below 40%.

However, the results in this study differ from findings presented by Gowele (2004) in Mkuranga district and Bwire (2001) in Magu district. One the one hand, Gowele reported a knowledge retention level of 100% and Bwire reported the retention lelvel of 96%. It should be noted, however, that Mkuranga and Magu districts receive support from NGOs contrasted with Lindi district. As a result, the CHMTs are facilitated to conduct regular supervisory visits, plan for on-job training activities and have reliable availability and distribution of drugs and other supplies. The lack of such support in Lindi district contributes greatly to the low level of knowledge retention and performance observed among the prescribers in this area.

5.3. Problems related to IMCI usage

Prescribers reported a combination of some factors encountered when attending pneumonia patients according to the IMCI guidelines. Lack of IMCI knowledge, heavy workload (due to understaffing and different reporting systems), longer time required by the IMCI to attend one patient (while there are adults and children waiting on a queue) and low motivation among the health workers were some of the factors mentioned.

Similar findings were reported by Tagheed, et al (2005) that health workers in areas with such problems will indicate poor usage of IMCI guidelines.

5.4. Health systems support

The study findings showed that antibiotics were not available in many health facilities. Eleven (68.8%) of them had no antibiotics for managing pneumonia cases. The other 5 (31.2%) had some oral antibiotics suspensions. This made management of children with pneumonia very difficult. This observation differs from findings from Morogoro and Rufiji districts (Bryce, et al, 2000) where the availability of antibiotics and other supplies reported was 93%.

This difference could be due to the fact that there was irregular supply of drugs to Lindi district from Zonal MSD in Mtwara. Drugs and other hospital equipment to the public health facilities were supplied by MSD. Sometimes, the Zonal MSD is out-stocked; hence, the public health facilities remain without drugs and other supplies. Money for procurement of drugs comes from the central government. Districts which have their own sources of revenue or from donors, could procure drugs from other supplier. Unfortunately, since Lindi District has limited internal sources of revenue, it depends on the central government for its procurement of drugs and other supplies.

Another reason for the lack of drugs in many of the health facilities was the misuse of the antibiotics. Children whose cards were reviewed by the researcher – a Medical doctor – knowledgeable on IMCI and by clinical observation revealed that not all the children with ARI needed antibiotics. Some children needed safe remedy and advice to mothers/caretakers. In this study it was found out that about 58 (57.4%) of the children whose illness did not need antibiotics were given the antibiotics. This practice could have contributed to unnecessary stock–out of antibiotics reported from 11 (68.8%) health facilities. This could lead to resistance to micro-organisms so that when the children get infections which needed the same antibiotics or others would not respond, thus causing more morbidity and mortality.

The other explanation for lack of drugs in the health facilities could be due to lack of transport for drug distribution from the district to health facilities. This could happen because of lack of vehicles to transport the drugs, unavailability of funds for fuel and impassable roads particularly during the rain season.

Findings showed that 14 (87.5%) prescribers reported to have IMCI guidelines and 2 (12.5%) prescribers could not show them to the researcher. Findings suggest that the IMCI guidelines, although present in some health facilities, were not used in guiding the prescribers during managing children with pneumonia.

The study found that there was no supervision, aiming at IMCI activities conducted in the health facilities for more than 1 year prior to this study. Problems arising from the lack of supervision include poor management practices, poor knowledge retention, lack of the on-job training, lack of morale, encouraging health workers to misuse drugs and lack of motivation for continuing education.

Lack of supervision could be due to the lack of transport of ferry the CHMT supervisory team members to health facilities. It could also be due lack of funds to purchase fuel for supervision or allowances. The roads could also not be passable by car especially during the rain seasons. The CHMT members could also be occupied with other activities thus unable to conduct supervisory duties.

Currently, the district has an IMCI Coordinator whose role, among others, is to conduct supervision and the on-job training to health workers. Fuel for undertaking this role has to be budgeted through the Basket Fund, which also has a limited amount. Given the fact that the district had about 41 health facilities, other members of the CHMT have to be trained on supervision so as to compliment the IMCI coordinator's activities.

5.5. Prescribers' workload

Regarding the workload of the prescribers, this study found out that the average number of patients attended by the prescribers on the day of study was 28 patients. These patients included the adults and children. The prescribers had to spend time on other activities including surgical procedures. Similarly, the Nurse Midwife prescribers had to do MCH activities such as attending mothers coming for antenatal services, taking body weight of children and giving vaccinations. This suggests that the prescribers spend less time attending children with pneumonia. In such a situation, adherence to IMCI guidelines was difficult.

In addition, heavy workload reported could also be due to the fact that in Lindi district there was no community IMCI (c-IMCI), whereby the family members could manage their children at home for mild illnesses without going to the health facilities for services. Similarly, the lack of funds has forced the District Council to delay in conducting training for community IMCI that makes many children to be sent to health facilities for mild illnesses that could be managed through safe remedy medications. Understaffing and the lack of qualified staff contribute to the heavy workload reported in Lindi district. In most of the health facilities there was only one qualified staff responsible for rendering all the care services provided at the health facility. It was, therefore, very difficult for such a prescirber to adhere to IMCI guidelines.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

The study found several gaps regarding the prescribers' adherence to IMCI guidelines in the management of pneumonia among under fives in Lindi district. This has led to make the following conclusions: Lack of supportive supervision and the on-job training has contributed to poor management practices among the prescribers in managing children with pneumonia. Similarly, it has played a great role in poor knowledge retention among the prescribers, which lead to provision of low quality services.

Health systems support, like the availability of drugs and equipment are valuable for the optimal standard of pneumonia management practices among health workers trained and supervised regularly. Although, misuse of drugs could take place at any facility any time, un-trained/unsupervised health workers stood higher chances of conducting such malpractice. Understaffing lead to overload in the health facilities and contribute to poor pneumonia case management practices. Continued learning is very valuable in improving and sustaining knowledge and skills among health workers.

In addition to on-job and refresher training programs, regular and continuous reading of professional publications and participating in professional discussions for the purpose of

sharing knowledge and experience should be planned for and encouraged by health officials from higher levels of the health system. Lack of funds experienced by the district council has lead to the failure to accomplish planned health activities included in the CCHPs, which raises a red flag on the districts', regions', national and global ability to improve the health standards of all citizens as agreed in the MGDs.

6.2 Recommendations

This study, therefore, makes the following recommendations:

First, Lindi District Council through its CHMT should strengthen supportive supervision and on-job training on IMCI so as to facilitate the provision of quality health care. The council should set aside enough funds obtained from revenue collection, the basket fund and the central government to be spent on health-related activities (such as purchase of fuel, allowances for the supervisory team and provision of reading materials for the health workers). The CHMT members, the District Council members and members of the community should be determined and committed to overcome health problems they are currently facing, using the meager resources available.

Second, the District council should budget for alternative purchase of drugs and other supplies in case the MSD has stock-outs or has overspent funds from the central

government. The distribution of these supplies should also be part and parcel of the CCHP.

Third, the District council, through the MoHSW, should employ more qualified staff so as to ease workload in the health facilities. The district council should submit its staff requirements to the Ministry to enable it employ the pre-services after they graduate from teaching institutions. In addition, it is recommended that IMCI training should be integrated in all pre-service and in-service training programs.

Finally, the CHMT, through the Continuing Education Coordinator should plan for, implement and encourage continuing education among the health workers. In the house training and discussions to share experience and skills could be initiated at the facility level. The district health coordinators could use the recently established libraries at each health center in the district to document professional publications (on IMCI and other health programs) for circulation among "motivated" health workers.

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