ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION SCIENCE AND SCHOOL OF PUBLIC HEALTH

FACTORS AFFECTING THE PRACTICES OF CLINICAL HEALTH WORKERS IN MANUAL PATIENT RECORD REGISTRATION PROCESS:

THE CASE OF ADDIS ABABA PUBLIC HOSPITALS.

By

SHIMELIS SHIFERAW DENEKE

A THESIS SUBMITTED TO SCHOOL OF INFORMATION SCIENCE AND SCHOOL OF PUBLIC HEALTH, ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN HEALTH INFORMATICS.

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ADDS ABABA / ETHIOPIA

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Signature of the board of examiners for approval

Name	Title	Sign	Date
_____	Chairperson	_____	_____
_____	Advisor	_____	_____
_____	Advisor	_____	_____
_____	Examiner	_____	_____
_____	Examiner	_____	_____

DECLARATION

This thesis is my original work and has not been submitted as a partial requirement for the degree in any university.

_____

Shimelis Shiferaw Deneke

January, 2014

The thesis has been submitted for examination with our approval as university advisors.

Ayele Belachew (MD,)

_____ _____

Ermias Abebe (MSc)

_____ _____

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Acronyms and Abbreviations

AAHB	Addis Ababa City Administration Health Bureau
AE	Adverse Event
CHW	Clinical health workers
DPT	Diphtheria, Pertussis (whooping cough) and Tetanus
EC	Ethiopian Calendar
EHRIGL	Ethiopian Hospital Reform Implementation Guideline
EFDRMoH	Ethiopian Federal Democratic Republic Minister of Health
HIE	Health Information Exchange
HW	Health Worker
HIV/AIDS	Human Immune viruses/ Acquired Immune Deficiency Syndrome
HMIS	Health Management Information System
MR	Medical Record
MIS	Management Information System
PMRN	Patient Medical Record Number
PRRP	Patient Record Registration Processes
PRISM	Performance of Routine Information System Management
RHIS	Routine Health Information Systems
NGOs	None Governmental Organizations
T-System	Template system
VRH	Volta Regional Hospital
VDRL	Venereal Disease Research Laboratory

Abstract

Introduction:- *The objective of the HMIS would be to record information on health events and check the quality of services at different levels of health care. One of the services is patient record registration process which could be affected by different factors.*

Objectives: - The general objective of this study was to assesses those factors like knowledge, attitudes, practices and demographic variables that might affect the practice of clinical health workers on manual patient record registration processes, in the case of Addis Ababa Public Hospitals.

Methods:-*An institution based cross sectional study was conducted using mixed (quantitative and qualitative) techniques. Two stage sampling methods were used to select the clinical health workers. Self administered questionnaires; interview and patient record review were used as data collection tools. A simple random sampling technique was used to access patient records. Percentile, frequencies, chi-square test and logistic regression were used for analysis. The study was conducted from February 2013 until December 2013.*

Results and Conclusion:- *Regarding the practices 44.1% of the clinical health workers have poor practices on manual patient record registration process. Educational level, sex and knowledge level of the participants were found to be factors that affect manual patient record registration processes. From multivariate logistic regression the health officers show 10.3 time good practices than specialists. Diploma nurses have 3.6 times good practices than the specialists. And also the B.Sc. nurses have shown 3.32 times good practices than the specialists. Regarding gender and practices on patient record registration process, males have 1.83 times good practice than females.*

To improve the practices of clinical health workers with high education level providing performance based motivation/ incentives may help in boosting the practices of patient record registration processes. Increasing number of nurses and implementing three shift systems might reduce the work load of the nurses. Providing sufficient attention and sufficient budget allocation by Addis Ababa Health Bureau is mandatory to improve data quality in hospitals.

Key words:-Patient Record Registration Processes, Data Quality, Patient Record Quality, Hospital Record System, Patient Records, Health Management Information System.

Chapter One

1. Introduction

1.1. Background

The medical record (MR) is the central documentation of the patient‘s visit to a health facility. A well-managed MR system is critical to provide efficient and high quality patient care. The primary purpose of the MR is to act as an immediate record available at all times. Documenting the patient’s presenting symptoms and the subsequent care and treatment.MR management system are designed to improve a patient’s health status by maintaining a MR that encompasses all aspects of a comprehensive health program. In addition, the MR function supports the observation and audit of hospital activities (FDRoEMoH, 2010).

In order to provide responsive and effective health services delivery, good health information is required. Without access to health and health related information, no health system can provide the expected outcome(Hirut Timerga, 2009) .

In hospitals or in any other health care providing institutions, health care workers carry out many duties including patient data registration. Health care providers working in hospitals are expected to collect different information from patients during the processes of treatment (Smith, 2005). The data collected from patients in the process of treatment by different health workers are called patient medical history or patient data. The physicians collect clinical data and examination results. The nurse assesses and controls medical administration. Most of the health care facilities in united state use a registration form (card) that contains details such as date of treatment given, patient demographic information, age (date of birth), address, social security number, insurance , financial information and emergency contact. Past medical history (such as illnesses, surgeries, and allergies), current medications, family medical history, social history (diet, exercise, smoking, use of drugs and alcohol), occupational history, and current patient complaint are recorded in patient’s own words (Booth,2009).

There are also other types of chronic disease registering that help as sources of data. The Chronic diseases registrations like those for breast cancer and cervical cancer done in USA, have similar importance (Cambridge University, 2000). It is true that complete, accurate, and well-

documented records are evidences of appropriate care. Appropriate care leads to a curative effect for the patient where as incomplete, inaccurate, altered, or illegible records may imply poor standards. Moreover, documentation in the medical record provides evidence of appropriate care. If a procedure is not documented, it is considered not done. Everyone who documents the patient record has a responsibility of recording patient medical data i.e. Triage officers, nurses, health officer and physicians are involved in patient record registration in a given hospital (Booth,2009).

Complete, accurate, timely storage and retrieval of a patient record is very important not only for physicians to give to a patient an evidence based treatment but also for different stakeholders such as hospital administrators, medical supplies chain management officers, health policy developers and researchers to deliver effective health care services(Messay Kitanbo,2012),(WHO, 2003).The health institutions in Addis Ababa suffer from a serious problem of recording and managing patient medical data(Freeman, Hjortdahl, 1997).The necessary systems that help facilitate the health management information such as reporting, planning are insufficient .The most important inputs like personnel budget and equipments needed to manage information processing activities are not sufficiently allocated in the health facilities (Freeman, Hjortdahl, 1997) .

Poor quality of information present in patient records is frequently associated with higher rates of adverse events and vice versa (Azeb Mengistu,2009).Literatures show that delivering high-quality medical care requires that healthcare providers should have access to essential information about patients' prior and current medical conditions. Moreover, lack of information—such as the knowledge about patients' life-threatening allergy to a medication—can lead to catastrophic adverse events (Smith , 2005). Thus good quality patient record registration is one of the most important activities to follow up adverse events. It also helps the health workers in improving the efficiency and the effectiveness of the health care services. Health workers are expected to take and document all the necessary information from the patient while treating the patient. Some work suggests that it is the responsibility of health workers to register patient data, which is produced in the processes of treatment. The process includes initial interview, completing medical history form, examination of vital signs, documentation of test results, and documentation of patient statement and the likes (Booth 2009)**.** This paper try to see

patient records quality in selected hospitals and what factors contribute poor patient record registration processes.

1.2. Statement of the Problem

The Health Management Information System (HMIS) is a broader concept which comprises the concept like data generation, processing and making available for users. However; appropriate use of date depends on data quality. In order to have quality data, the data collected and presented must be accurate, complete, reliable, legible and accessible to authorized users (Messay Kitanbo, 2012). Previous research works conducted on HMIS in Addis Ababa public hospitals and other places have touched the issues of data quality very slightly in general as HMIS by using Performance of Routine Information System Management (PRISM) frame work and Routine Health Information Systems (RHIS). This makes over shadow/ less focused to assess the issue of patient record registration processes from its base (Mekonnen Wagaw ,2009).

The principal investigator went to different public hospitals in Addis Ababa looking for well organized patient records for data mining purpose. This gives a chance to the principal investigator to see the problems on quality of data in hospitals. Therefore addressing factors that affect the practices on patient medical records registration processes would be imperative. This gap has inspired the researcher. In addition, data generation and consumption processes were assessed and addressed. The assessment made was general on HMIS designee and data consumption by some researchers but it assesses less about patient record registration processes (Mekonnen Wagaw ,2009), (Mesert Ayano, 2009).

Some studies have given important insights into the problem. One of the researchers has made a studied to identify factors affecting the generation of data and utilization of information in ten selected public hospitals in Addis Ababa in the year 2009, again most of the studies done one years back before the Ethiopian Hospitals Reform Implementation Guidelines were not introduced. The study found that utilization rate of HMIS information at the hospital level is 52.1% and generation is weak(Gashaw Andargie 2004). Another study conducted in 2006 reported that the utilization of information rate was 22.5% in all the study units and 8% in HIV/AIDS units. The format, the time to access and the possession are the key factors

determining utilization of HMIS information(Stott ,1983). These study exhibits that the process of generating information is weak and the utilization rate is also low. Yet the study states the problem with limitation of resource, shortage of skilled personnel, absence of periodic staff trainings, inadequate number of staff, inappropriate working environment, and absence of regular feedback and monitoring (Gashaw Andargie, 2004).

By taking all these facts into consideration, assessing the issue of patient record registration process from its base is very crucial. This is because, if we do not have quality data, we couldn't generate useful information that enhances decision making of the users (Messay Kitanbo, 2012). Poor patient record registration leads to occurrence of adverse event; high treatment cost, long hospital stay and also hinders the communication among health workers. Most of the researchers examined the issue at system level (Azeb Mengistu,2009), (Gashaw Andargie, 2004). And less is done at data generation level. However, this research focuses specifically on the practice of clinical health workers on patent record registration processes.

Therefore, this research attempts to examine the factors that affect patient record registration process. And knowledge and attitude of CHWs were assessed as factor that might contribute to poor patient record quality. And also the statuses of patient records were assessed in selected hospitals. Therefore this research makes inquiries as basic question: What are the factors that affect the patient record registration processes in the day to day practices of the CHWs?

1.3. Objectives

1.3.1. General Objective

➢ The general objective of this study was to assess those factors that affect the practices on manual patient record registration processes in Addis Ababa Public Hospitals. During the year 2005 E.C. (focusing on clinical health workers)

1.3.2. Specific Objectives

Specifically this research tried:

➢ To determine the level of CHWs knowledge about patient records registration processes.
➢ To assess the CHWs attitude towards patient records registration processes.
➢ To measure the CHWs practices about patient records registration processes.
➢ To describe patient records quality in the selected hospitals.
➢ To measure the association of knowledge CHWs on patient record registration processes with their practices.
➢ To measure the association of CHWs attitudes with their practice on patient records.

1.4. Significance of the Study

This study tried to uncover factors attributed to poor patient record registration processes in the public hospital of Addis Ababa City Administration Health Bureau. The finding of the study provided existing factors on patient records registration processes, regarding knowledge, attitude and practices of the health workers based on the Ethiopian Hospital Reform Implementation Guidelines.

Therefore, it helps stakeholders use the result to fix the problem and to enhance patient records quality. Specifically it helps the care givers to improve their services. And also it helps the hospital administrators and Addis Ababa health bureau officials to solve the problem of data quality.

The result of this research also help policy and strategy designers to show what should be done to solve patient record problems for hospitals.

Since the problems caused by poor data quality are multi-faceted and fixing the problems of poor data quality in the hospitals will help to alleviate the problem of data users in hospitals such as primary clients (the patient and the clinical health workers), will be benefited from the result. Researchers, public health workers are also the ultimate beneficiaries of the result of this study.

1.5. Scope of the Study

This research tried to assess factors that affect the practices of the CHWs towards manual patient record registration processes in three selected public hospitals. It also considered completeness, error correction style, knowledge level, attitude level and there practices of the health workers as factors on patient medical records registration processes based on the Ethiopian Hospital Reform Implementation Guideline in the Addis Ababa Public Hospital. This research also tried to see the status of the patient record quality level.

This research focus on part of the health management information system that is patient records registration processes and describes the data quality level.

This research does not include reporting system, financial system and measuring the effectiveness and efficiency of the health care service.

This research also do no not include more technical concepts such as “dose the patient records includes medically content sufficient or insufficient based on the disease” because to measure the depth of the patient records it needs especial knowledge and it is beyond the scope of this paper. However it tries to see from patient records quality according to the Ethiopian Hospital Reform Implementation Guideline(FDRoEMH, 2010).

2. Literature Review

The literature part comprises definition of related facts, the next part considers related literatures in relation to factors like knowledge, attitudes and practices of the health workers in different income setting countries and finally the data quality dimensions and the patient record recording implementation guide line related facts will be presented .

2.1. Medical Records and Medical Record Management

The medical record(MR) is chronologically written account of a patient's examination and treatment. It includes the patient's medical history and complaints, the physician's physical findings, the results of diagnostic tests and procedures, and medications and therapeutic procedures and finally the centeral documentation of the patient’s visit to a health care facility(American Heritage Medical Dictionary,2004).

Medical Records Management is the art and science of managing all information relating to the operation of a healthcare practice. This includes filing and storing patient charts, scanning medical records, ensuring adherence to regulations and retention schedules, and managing the destruction of medical records after their retention period. Medical records management also involves effective administration of a practice's non-clinical information including accounting records, contracts, and other business-related documentation (Shoreline Recording Management Inc. ,2014)]. Record keeping has traditionally been the responsibility of the health authority and patients have generally been excluded from this process as a result of these poorly informed patients who lack interest in their own medical information will be created. With the changing face of medical care and the fact that it is becoming difficult and sometimes impractical to obtain continuity in care by an individual caregiver, emphasis has been placed on the continuity of medical records and health care teams (American Heritage Medical Dictionary,2004).

Delivering high-quality medical care requires that healthcare providers should have access to essential or useful information about patients' prior and current medical conditions. Moreover, lack of useful information such as the knowledge about a patient's life-threatening allergy to a medication can lead to catastrophic adverse events. Thus, one of the most significant and promising trends in healthcare information technology is the emergence of Health Information

Exchange (HIE)(Smith, 2005). The health information exchange is possible if all the necessary data are registered properly and regularly. The data registration process should attain its data quality in order to use it as information exchange.

2.2. Record Management

Records management refers to the management or control of records in different formats. These are hard-copy files, correspondences, disks, maps, memoranda, microfilm, papers, photographs, encoding, reports and tapes. This ensures that records are easily accessible, retrievable and properly classified(Webster, Hare, Julie, 1999).

2.3. Management Information System

The role of the MIS in an organization can be compared to the role of heart in the body. The information is the blood and MIS is the heart. In the body the heart plays the role of supplying pure blood to all the elements of the body including the brain. The heart works faster and supplies more blood when needed. It regulates and controls the incoming impure blood, processes it and sends it to the destination in the quantity needed. It fulfills the needs of blood supply to human body in normal course and also in crisis. The MIS plays exactly the same role in the organization (Sarra, 2013).

The system ensures if appropriate data is collected, processed, and sent further to all the needy destinations. The system is expected to fulfill the information needs of individual health workers, a group of individuals like case team members and leaders, the management functionaries: the managers and the top management and policy makers, and researchers (Sarra,2013).

2.4. Health Informatics

Health informatics is defined as “an evolving scientific discipline that deals with the collection, storage, retrieval, communication and optimal use of health related data, information and knowledge. The disciple utilizes methods and technologies of the information science for the purpose of problem solving, decision making and assuring highest quality of health care in all basics and applied areas of biomedical sciences (Graham,1994).

2.6. Data Quality and Adverse Events

The quality of the data is measured by its Accuracy (No errors, no outliers), Completeness (no missing values), Consistency (no inconsistent values and attributes), on time (appropriateness), Believability (acceptability), Interpretability (easy to understand by users), and also misplacing the entry of one content to different place. If one of the above units of measurements is missed, the quality of the data will be affected (Kohn , Corrigan , Donaldson ,2000),(Agency for Healthcare Quality and Research , 2013).

According to the research, 7926 hospital admissions of 21 Dutch hospitals were analyzed with a structured record review method. The occurrence of adverse events, the presence of patient information and the quality of the present information (completeness, readability and adequacy) were assessed. Their association was analyzed using multilevel logistic regression analyses (MARIEKE ZEGERS,2011).

The result showed that the absence of record components was associated with lower rates of adverse events, suggesting that missing record components lead to an underassessment of adverse events in record-review studies. In contrast, poor quality of the information present in patient records was associated with higher rates of adverse events. They concluded that evidence-based standards format for record keeping are necessary for standardization of recording patient information(MARIEKE ZEGERS,2011).

A research was done in Tunisia, University Hospital of Monastery, by using a two-stage retrospective medical record review of 620 inpatients admitted during 2005 based on the use of 18 screening criteria. Records were reviewed by a trained medical student, then by an expert physician, and the result showed that among 620 inpatients, 62 inpatients experienced an AE with an incidence of 10% (95% CI [7.6– 12.3]). Surgical/invasive procedures and therapeutic errors were the most common AEs (55% and 21%, respectively). Among the confirmed events 60% were judged to be highly preventable and 21% led to patient death. All ages and both genders experienced equal rates of AEs. However, patients who experienced these events were significantly more exposed to extrinsic risk factors (all surgical interventions and invasive procedures that were listed in the revue form 2 of the questionnaire). Physician reviewers

estimated that a total of 570 additional hospital days were associated with AEs(MONDHER ,SANA ,2010).

2.7. Knowledge, Attitude, and Practice of Health Workers in Relation to Patient Records

The medical record of today not only reflects the care giving to the patient, but also become a communication tool to a wide variety of players (Murphy,2013). Medical records are commonly used to measure quality of care. However, little is known about how accurately they reflect patients' clinical condition. Even less is understood about what influences the accuracy of provider's documentation and whether patients' characteristic affects documentation habits(Cradock, A.Y, 2001).

The recent interest in organizational learning, transitive knowledge systems, human and intellectual capital, and knowledge management in general brings to the fore a fundamental question: How can we measure the knowledge held by individuals and groups?(Darwin, Hunt ,2013). One common measurement tool is the standardized test: a multiple-choice test scored with the help of a right answer key. However, in many organizational research settings, the right answers are not necessarily known by the researcher. An alternative approach that does not require an answer key is to ask individuals to rate their own levels of knowledge, or to ask members of a group to rate each other on amount of knowledge, and average their various estimates for each person(Stphen, Borgatti, 2005).

Some of studies that measure these facts presented as follows:-A cross sectional descriptive study was conducted in 11 heath facilities in Kilombero district in Tanzania, between January and February 2008. A semi-structured questionnaire was used to interview 43 health workers on their knowledge, attitude, practice and factors for change on HMIS and HMIS booklets from these facilities were reviewed for completeness. Of all respondents, 81% had never been trained on HMIS, 65% did not properly define this system, 54% didn't know who is supposed to use the information collected and 42% did not use the collected data for planning, budgeting and evaluation of services provision. Although the attitude towards the system was positive among 91%, the reviewed HMIS booklets were never completed in 25% - 55% of the facilities. There

were no significant differences in knowledge, attitude and practice on HMIS between health workers (Nyamtema, 2010).

The most common type of HMIS booklets which were never filled were those for deliveries and accounts to 55%. The gaps in the current HMIS were linked to lack of training, inactive supervision, staff workload pressure and the lengthy and laborious nature of the system. And the research concludes a state of poor health data collection, lack of informed decision-making at the facility level and the factors for change in the country's HMIS are needed. It suggests need for new innovations including incorporation of HMIS in the ongoing reviews of the curricula for all cadres of health care providers, The result also shows that 81% of the respondents' have never been trained on HMIS components and also there is no satirical significant differences in the proportion of the health workers trained for HMIS between the clinicians 17% (95% CI: 2% - 32%) and nurses 20% (95% CI: 2% - 38%). 54% the respondents' did know who are supposed to use the information collected at the health facility, 40% didn't know the importance of HMIS. Regarding their attitudes almost all respondents 91% had positive attitude towards HMIS. There was no significant difference in attitudes of health workers towards HMIS between clinicians 87% (95% CI: 74% - 99%) and nurses 95% (95% CI: 93% - 98%). 91%) the health workers agreed that the system (HMIS) was worthy for the time and other resources spent filling and processing data, and that it was important to continue with the system(Nyamtema, 2010).

However, 42% of the respondents pointed out that the current HMIS was difficult, complicated and that it needed to be simplified. Although they were generally positive they needed a better system .The practices of the health workers, were reported as, of the respondents 42% had never used the HMIS data collected at the health facility level for planning, budgeting and evaluation of services provision. This was attributed by almost three quarters (70%) to poor knowledge on data analysis. The other major reasons for failure to utilize the local data were poor quality of data and poor managerial skills reported by 16% and 7% of the respondents respectively (Nyamtema, 2010).

On another knowledge, attitude and practices research it was stated that, the usage of abbreviations in final diagnosis and surgeries and 85.8% did not know duration of confirmation of verbal orders. The relationship between knowledge and educational course was significant ($p<0.05$). Only 10% completed the medical chart legally. Most of assistants tended to record clinical data. There was a significant relationship between practice, education course and knowledge ($p<0.05$) (Siamian,2008). Majority of the respondents have good attitude towards medical documentation for patient's medical record registration. Also 88.9% of them believe that recording of clinical data is considered as a supportive for proper caring of the patients. And 55.1% were against of medical records documentation by medical records students because they are not in direct contact with the patients (Odhiambo-Otieno,Gorge,2005).The practice of the society under study showed that 34.6% of trainees on completion of medical history were good, while 11.5% were weak. Considering the importance of medical history sheet on diagnosis of diseases and subsequent treatment, it is necessary all of the students complete it properly. In this regard, 41.4% of trainees were good and 50% were moderate. It was found that 77.8% of the participants had low knowledge about medical records documentation and 54.1% of them did not have good attitude about completion of medical records (Odhiambo-Otieno,Gorge,2005).

For determining the relationship between knowledge and practices, β Kendall's Tau Test was used finding was 0.005 and p value = 0.438, which is insignificant. Relationship between Practice and attitude considering the above condition and using of β Kendall's Tau Test was 0.003 and p value = 0. 967, that was insignificant. The relationship between knowledge and attitude was determined by β Kendall's Tau Test, because two variables were grading which was 0.008, p values =0.967 which is insignificant. For determining the relationship between knowledge and performance(practices), β Kendall's Tau Test was used finding was 0.005 and p values = 0.438 which is insignificant results of this study indicate that delinquencies of medical records at these university-affiliated hospitals are due to lack of awareness of the students towards the method of medical records documentation. In addition, lack of desire in completion of records can affect quality of their practice (Siamian, 2008).

Evaluation of existing District Health Management Information Systems undertaken by another research from Kenya concluded that the existing district HMIS were not supportive for the manager's strategic function and for operational management. Much information is collected at

the grass root level simply for the sake of sending to the higher level but no trained staff to analyze and use at the collection point. The existing manual systems for collection, storage and retrieval were not facilitating timely availability of information for decision-making. The researcher recommended an urgent need to explore the possibilities of computerizing the existing manual system to take advantage from the technology (Odhiambo-Otieno,Gorge,2005).

One way of increasing knowledge is health information exchange among health care providers. A cross-sectional mail survey was conducted in Massachusetts in 2007. On the physician attitudes toward health information exchange: results of a statewide survey**,** Massachusetts, 2007. 296 questionnaires were returned making the response rate 98.3%. And the report shows that, overall, 70% indicated that HIE would reduce costs, while 86% said it would improve quality and 76% believed that it would save time. On the other hand, 16% reported being very concerned about HIE's effect on privacy, while 55.0% were somewhat concerned and 29% not at all concerned. Slightly more than half of the physicians (54%) said they would be willing to pay an unspecified monthly fee to participate in HIE, but only 37% said they would be willing to pay $150 per month for it. Primary care physicians and those in larger practices tended to have more positive attitudes toward HIE. The overall knowledge and attitude on HMIS basics concept was found to be relatively good. But not seem to correspond with practice as it is comparatively very low. About 70.6% of the respondents' were found to have good knowledge. The favorable attitude score was found to be 81.08%. Concerning the practices only 20.6 % of the respondents were found to have good practice and significantly associated with unmarried status. [COR=3.22(95%CI=1.80, 5.75)] and [AOR=2.67(95%IC=1.28, 5.59)] from professional category, degree holders had better practices of HMIS [COR=2.93(95%CI=1.37, 6.24)] and [AOR=2.93(95% CI=1.06, 811) (Wright, 2007).

The study was done on knowledge, attitude and practices of health workers on health management information system at health center level in North Shoa Zone, Oromia Region of Ethiopia in 2010, with response rate 98.3%. The report shows that ,labeled knowledge level as good if the health workers could scored mean score above 50% and the attitude health workers were labeled as good or favorable if they could scored>50% on the median. It had reported that, the overall knowledge and attitude of the health workers on HMIS basics concept was found to be relatively good. But not seem to correspond with practice as it is comparatively very low.

About 70.6% of the respondents' were found to have good knowledge and the practices were considered good if they had score mean score >75% of the practices. And the result 70.6% of them found to have good knowledge, and 81.0% were found to have favorable attitude. Only 20.6% health workers were reported to have good practices. And from professional degree holder had better practices and insignificance association [COR=2.93(95%CI=1.37, 6.24)] and [AOR=2.93(95%CI=1.06, 8.11)]. According to the in-depth interview results, lack of training and full time HMIS works, unstandardized data collection and reporting tools were underlined as the main factors for malpracticing of HMIS at the health center (Tegegn Kifle, 2010).

2.8. Quality Determinants

According to Lungo from University of Oslow, he also explains that the causes of the low quality of the data identified include incomplete, inaccurate, and untimely reporting; lack of resources and office space. The study found that the behavioral determinants are largely affected by organizational and technical determinants. Utilization of information is affected by technical factors (availability of skilled personnel and facilities) making reliable information timely(Lungo,Hemed,2003).

Demand for HIMS, confidence, motivation and competence of personnel affect HMIS processes and performance directly, hence how an individual feels about the utility, his/her skill and confidence in performing that task all affect the likelihood of that task being performed (Aqil ,2009). Similarly, the attitudes towards the usefulness of quality data for informed decision from the demand side is also the major behavioral factor hindering the performance of HMIS. If people well understood the utility of HMIS, they feel confident and competent in performing the task, and will complete the task diligently (Sarra ,2013).

According to the research report from Ethiopia, Some of the data quality dimensions were taken to assess the medical record quality such as measured medical records accessibility, completeness, and physician satisfaction. And the result shows medical record accessibility and completeness and physician satisfaction improved significantly (P, 0.05) based on pre- and post-intervention comparisons. The success rate of retrieving the proper medical record number for returning patients improved from 14% to 87% (P, 0.01). Time to locate and access medical

records decreased from 31.2 sec per record to 15.7 sec per record (P, 0.01); the percentage of complete medical records increased from 6.5 to 45.7% (P, 0.01). Physician satisfaction with the medical records system was significantly higher after the intervention (P¼0.02). Finally the researchers concluded that a well-organized medical record management system can be effective in improving patient information accessibility and completeness in hospitals in low-income countries despite the lack of resources. Moreover to improve the performances of patient medical recording needs sustainable follow-up is required(Elizabeth, Wong , 2013).

Another study reported by Marincowitz in 2004, recommends the use of patient–retained medical health record in South Africa. This type of record has standard format (booklet) owned by the patient. According to him, it should be encouraged throughout the district that he studied. He states that staff should be motivated to use it to standardize the information that is recorded and health planners should be motivated to implement it (GJO, 2004).

According to related research from Ethiopia, had tried to see the problem from the point of view of health information consumption by patients and health consumers in public health institutions in the city(defines health consumer as all consumers of health information except patients). It includes planners, researchers, the public, etc(Mekonnen Wagaw,2009). The research has used Performance of Routine Information System Management (PRISM) frame work and Routine Health Information Systems (RHIS) determinants as the best tools to evaluate data quality following Aqil et al. These determinants are grouped under three categories: organizational, technical and behavioral (Mekonnen Wagaw,2009),(Mesert Ayano , 2009).

Organizational determinant: features that are related to leadership, structure, culture role/responsibility in the organization.

Technical determinant: issues related to system design, data collection forms, technology skills and knowledge of personnel.

Behavioral Determinants: factors associated with attitudes, motivation and values are behavioral determinants. Generally, the above determinants are used to test the quality and standard of the patient records and to confirm its validity.

Employing behavioral, technical and organizational determinants, Mekonnen has evaluated the direct or indirect influence of the structure and leadership, data collection formats, the knowledge, and attitude of the health workers on routine health information system processes and performance in Ethiopian context. The result of his study shows poor data recording system (poor practices) and a problem of using the data (consumption of health information) in the health institutions that he selected for his research. However, despite the fact that his study has shown the problems that exist in the health management information system, it has the following limitations. His focus is specifically on the consumption of health information, not on assessing the factors affecting the quality of patient data registration and management, which are the most serious problems in the health care sector. In addition, the researcher has extrapolated the result to the whole country. Even he does not show the whole situation of Addis Ababa due to the problem of samples taken. Besides, the researcher has assumed hospital and health center as similar. Similarly, on related research from Ethiopia, Addis Ababa has also stated that the process of generating information is weak and utilization rate is also low in Ethiopia Public Hospitals(Mekonnen Wagaw,2009).

According to meseret, the problem is mainly attributable to shortage of skilled personnel, absence of periodic staff trainings, inadequate number of staff, inappropriate working environment, and absence of regular feedback and monitoring (Mesert Ayano, 2009). She, however, indicates that, with all the limitations, the tendency of utilizing HMIS for decision-making is encouraging**.** Despite this, her research shows that the generation and utilization of information system as whole is weak in Addis Ababa Public Hospitals.

2.9. Implementation Guidelines for Patient Medical Records

Research result show that, an implementation strategy contributes to change in individual behaviors towards the good practices in implementing the given procedure or process. The study done on 12 people with extensive experience in leading clinical guideline implementation were identified who were thought to have particularly keen insight into the process (Comm, Qual , 2013).

Studies of clinical guideline implementation have focused almost entirely on changing individual clinician behavior with different intervention strategies. Implementation efforts must use multiple strategies that take account of multiple characteristics of the guideline, practice organization, and external environment (Comm, Qual , 2013). Moreover another study which shows the importance of strictly adherence to the implementation guideline using was conducted in 1995 at five primary care clinics of a staff-model health maintenance organization in the Midwest to assess the impact of a cystitis (woman bladder infection disease) clinical guideline and to help elucidate the guideline implementation process(LI, LA,2013).

As result use of a recommended three-day antibiotic treatment increased from 28% to 52%. Use of urine cultures decreased from 70% to 37%. The proportion of eligible cystitis cases coordinated primarily by the nurse increased from 21% to 78%. However, desired changes in use of antibiotics and urine cultures were limited to nurse-coordinated cases. There was no increase in hospital admissions, emergency room visits, repeat office visits, or repeat antibiotic courses after cystitis guideline implementation. Cost of cystitis care delivered after guideline implementation was 35% lower than before guideline implementation. This shows that the use of implementation guideline how much associated with desirable changes in antibiotic use, nurse coordination of care, costs of care, and comparable clinical outcomes. Clinics that used clinical systems and tools to support nurse-coordinated cystitis care had greater guideline adherence than clinics that did not support nurse-coordinated care (LI, LA,2013). The Ethiopian Hospital Reform Implementation Guideline conceded a comprehensive business rules to be followed by all health workers in the processes of service delivery. There are different activities to be performed in the processes of patient medical record registration or documentations. Some of the basic contents like, if medical document are need to be altered what has to be done while documenting are listed as follows (FDRoEMH, 2010),(Watson 2006).

2.10. Error Correction Style

No information or entry may be removed from a health record. An error or incorrect entry discovered in the record may be corrected by placing a line through it with ink and correcting it. The date of change must be entered and the correction must be signed in full. The original record must remain intact and fully legible. Additional entries added at a later date must be dated and

signed in full. The reason for an amendment or error should also be specified on the record much more is included in the guideline (FDRoEMH, 2010),(Watson 2006).

Another good practice from implementation guideline in the health care professionals the importance of using check list for health record keeping about the patient medical records its completeness and, conciseness and also it should be consistent, Self-serving or disapproving comments should be avoided in patient records. Unsolicited comments should be avoided (FDRoEMH, 2010),(Watson 2006).

A standardized format should be used (e.g. notes should contain in order the history, physical findings, investigations, diagnosis, treatment and outcome). Copies of records should only be released after receiving proper authorization. Billing records should be kept separate from patient care records. Attached documents such as diagrams, laboratory results, photographs, charts, etc. should always be labeled. Sheets of paper should not be identified simply by being bound or stapled together – each individual sheet should be labeled, and should have an identifier. (FDRoEMH, 2010),(WHO,2004).

2.11. Comparison Between Paper and Electronic Medical Recording Time

Nowadays, using information systems in the healthcare environment seems to be inevitable, since there are many potential benefits(J.L, 2006),(J., Perry, 2013). These benefits include improving the quality of care, reducing medical errors, and improving communication between healthcare professionals (J.L, 2006), as well as enhancing the readability, availability, and accessibility of information, and improving data quality (J., Perry, 2013).

On the study that was done in comparison of paper documentation verses electronic medical record for non-traumatic chest pain to determine differences in time for physicians to complete medical records using paper versus electronic medium in a single tertiary care academic emergency department at *University of Ottawa Ontario, Canada* using stopwatches. This study enrolled 100 non-traumatic patients with chest pain in the before period and 73 in the after period. The template-based electronic medical record time was longer than using the paper documentation charting, (9.6±5.9 min vs 6.1±2.5 min; $p<0.001$). The template-based electronic medical record in this study was significantly more time-consuming to complete than the current

paper record. And they did not see more patients by using the electronic medical record. Given the enormous time pressures on emergency physicians in overcrowded emergency departments, the issue of creating increased time to record medical information must be addressed before widespread uptake of electronic medical charting will be possible (J., Perry, 2013).

A prospective randomized trial of documentation with a template system (T-System for Primary Care, Dallas, TX) versus undirected handwritten documentation was conducted in 2 separate teams of a single family medicine residency program. After training, one team used the template system and the other team used undirected written documentation. Clinic visit duration was recorded. Medical records were evaluated by a blinded professional coder to assign an evaluation/management code. For the purpose of compression between a template-driven medical documentation system to undirected hand written documentation and determine whether the template decreases physician evaluation time, and increases physician satisfaction with the documentation process. As a result a total of 1339 patients were included in the analysis of patient visits (Mulvehill, 2005).

There was no significant difference in clinic time between the template system and the written documentation visits. The mean visit time was 1.75 hours for both teams. The template medical documentation system compared with undirected written documentation, yielding no differences in evaluation time, and was overall positively received by the residents and faculty (Mulvehill, 2005).

2.12. Medical Records Completeness

Quality improvement projects, research, and legal issues all rely on a complete accurate record. Coding, billing, and reimbursement depend on accurate documentation in specific areas. The process of recording a patient visit takes time, thereby affecting physician productivity and income. Time spent by physicians completing records can lengthen their day and create frustration. Family physicians use many different documentation methods today in their practices. These include undirected written charts, template-based written charts, dictation, and electronic medical records (Beatrice, Bella, Johson, 2011).

The study was conducted within a period of two months at the Volta Regional Hospital (VRH), Ho, in Ghana using qualitative research method and the result were reported as, a standard to guide nursing documentation was absent. In addition, nurses are trained in nursing care plan but had to use other types of documentation style at the work setting. Also the study provides insight into issues in the nursing documentation and accordingly would inform the Nursing Body in Ghana ,Also the nurses make use and rely more on oral account of patient care than the written documentation .And the research concluded that at times the information captured was not adequate to communicate to others (Beatrice,Bella,Johson,2011).

Consequently efficient communication of patient care does not only enhance collaboration, but also provide the atmosphere for effective care and the guarantee of patient´s safety through identifying and noting down changes in patients condition. It also provides a strong base for decision-making concerning patients treatment. Nursing documentation being part of patient's record is crucial in achieving this aim; this is because nurses form the majority of the health care team. They are also the only health care professionals who spend twenty four hours with the patients, therefore they generate a lot of information from the care process, which decision making for patients care is depended on. However, this valuable tool for the nursing profession seems not to be at its best in Ghana. One can imagine the effect of this on quality care and patient's safety because quality is proved to be car enhanced by accurate patient's information that can be communicated to the members of the health team. The study found out issues that undermine the quality and communicability of the nursing documentation at VRH. However, it was also noted when reviewing the literature related to the study that, similar issues identified in this study have been discovered in other parts of the world but they seem to be unsolved, as they still exist (Beatrice,Bella,Johson,2011).

The completeness of the HMIS forms / booklets were reported by the study as ,Of all reviewed HMIS booklets only a single delivery register from only one health facility was judged to be 100% complete. These booklets, however, were not filled in as many as 55% of the health facilities. The types of information that was found not recorded in the booklets for postnatal services (child vaccination/weight) were measles vaccine, DPT 3, polio vaccine and Vitamin A. These services were not recorded in these booklets despite the fact that it was assumed that these important health interventions had been given to the clients. The type of information which was

mostly not filled in the delivery booklets was the condition of the mother at discharge. The parameters which were commonly missing in the antenatal services' booklets were pregnant mothers' risk factors, VDRL test, TT vaccination and height. Reasons for such incompleteness found were lack of VDRL reagent, workload pressure, forgetfulness and poor knowledge on data recording (Beatrice,Bella,Johson,2011).

The perceived recommendation by the health workers to solve the problem were reported by Nyamtema, almost all respondents 95% recommended training of health care providers in order to improve HMIS. Almost a quarter 23% of respondents recommended for improved supervision and increased staffing levels at the facility level. Only 19% recommended for revision and simplification of the HMIS to be more user-friendly (Nyamtema , 2010).

3. Methodology

3.1. Study Setting and Period

The study is done in Addis Ababa /Ethiopia .Addis Ababa is the capital city of Ethiopia. Addis Ababa had 33 Hospitals out of these 13 of them are administered by public, and also six of them is administered by Addis Ababa City Administration. There are also 28 Health Centers and 35 Health Posts according to the report published by Ethiopian Federal Democratic Republic Minister of Health (FDRoEMoH), on health and health related indicators of Ethiopia((FDRoEMoH, 2008).).

Out of the thirteen public hospitals, six of them are administered by Addis Ababa city (AAC) administration. Half of the hospitals administered by AAC administration were included in this study. These hospitals are Menilik II Memorial, Yekatit 12 memorial, Zeweditu Memorial Hospitals.

The study was conducted from February 2013 until December 2013.

3.2. Study Design

An institution based cross sectional study was conducted using mixed quantitative and qualitative techniques to assess the practices of patient record registration process.

3.3. Sampling Technique and Sample size Determination

3.4. Target Population

The population is all clinical health workers who work in six public hospitals that are administered by Addis Ababa Health Bureau. The list of the six hospitals is Tiruneshi Beijing, Yekatite12, Zewditu Memorial, Gandhi Memorial, Menelik II Memorial, and Ras Dest Damitew memorial Hospitals. And also includes patient records that are treated in the first three consecutive months of the year 2005E.C.

3.5. Study Population

The study population were clinical health workers (CHW) working in the three public hospitals, namely Menilik II Memorial, Yekatit 12 memorial and Zeweditu Memorial Hospitals. Besides this patient records for patients treated in the first three consecutive months of the year 2005E.C.

3.6. Sample Size Determination

The sample size was determined for CHWs using single proportion population formula (W, ,Daniel , 1995).As the formula is stated below.

$$n \text{ (desired sample size)} = (Z_{\alpha/2})^2 * p\,(1-p)\,d^2$$

The following assumptions were presumed to hold true to calculate the sample size.

$Z_{\alpha/2}$= 1.96 for a 95% confidence level.

P (proportion of health workers assumed to practice above the mean patient record registration) = 50%

d = margin of error between the sample and population, 5% marginal error is admitted

Thus, $$n = \frac{(1.96)^2 X\ 0.5(1-0.5)}{(0.05)^2} = 384$$

Based on the above calculation, the minimum sample size is 384. Taking in to account 10% non-respondent rate, the total sample size will therefore be 423.

3.7. Sampling Technique

Two stage sampling methods were used to select the CHWs. At first stage simple random sampling method was used to select the three hospitals out of six public hospitals. Only six public hospitals administered by AAHB were considered. The numbers of the hospitals selected were three because of the time and resource limitation during the data collection time.

At the second stage, stratified consecutive method was used to select the health workers from the selected hospitals. This is done by using the health workers professions as stratum. The list of each stratum was identified from each hospitals human resource department to calculate the proportion of each stratum (Table.1). Based on the numbers of health workers available during the data collection period were included until it arrives at the proportionate to sample size was calculated for each categories of health workers at each hospital.

The stratum of CHWs included were Specialists, General practitioners (MD), B.Sc. Nurses, Diploma nurses, and Health officers are formed as strata.

From three of the selected hospitals, 423 clinical health workers were invited for the self administrated questionnaires.

Table.1 Population of the clinical health workers, from three selected public hospitals in Addis Ababa, as February 2013

Hospital Name	**Health Workers**					
	MD+ specialist	**General practitioners**	**Health officer**	**B.Sc. Nurse**	**Diploma nurse**	**Total**
Yekatit 12	17	27	14	80	111	25
Menielik II	17	34	10	76	91	254
Zewidetu	9	27	11	55	128	239
Total	43	94	37	224	318	750
Ratio	0.06	0.123	0.051	0.303	0.46	1
Factor& result	0.06*423	0.123*423	0.051*423	0.303*423	0.46*423	1*423
Sample	26	50	22	129	195	423

This gives the proportionate fraction of each stratum as sample to be included in the study population. The exact selected sample was 26 Specialist, 50 General practitioners, 6 Dentist, 22 Health officers, 129 B.Sc. Nurses and 195 Diploma nurses were selected.

In addition, to assess the performance of the CHWs on the patient record's quality, the patient records from each selected hospitals were reviewed. To select one quarter of the year from the

year 2005 E.C. The months categorized in to four categories each with three months .And the first were randomly selected from all others. To identify the patient lists that were treated during these three months the logbook in each selected hospitals were consulted. Then patient record which were treated by the year 2005 E.C. of the first three months were used as a sampling frame in each selected hospitals to draw patient records. The lists of patient records in the selected months were accessed from the logbooks of each hospital. Then simple random sampling was used to locate and access the patient record. This structured patient record review was done to assess the data quality dimension like completeness, legibility of records and error freeness. Fifty five patient records were reviewed from each hospital. And a total of 166 patient records were reviewed.

Besides, in-depth interview has been conducted with purposive selection of participants from Addis Ababa Health Bureau officials as focal person.

3.8. Data Collection Tools and Techniques

Self administered questionnaires, patient record review, and in-depth interview were used as data collection tools and each parts were described below.

3.8.1. Self-Administered Questionnaires

The self-administered questionnaire was used for CHWs which have four parts. The first part is to elicit socio-demographic characteristics of each study participant. The second part of the self-adminstoreed questionnaire was used to assess the knowledge of the CHWs. The assessment was done based on the Ethiopian Hospital Reform Implementation Guideline (FDRoEMH, 2010).The knowledge of CHWs was examined in two forms. Eleven Questions with answers key, and six questions with unknown answers were used. The third part of the self adminsteored questionnaires were parts that assess participants' attitude toward patient medical records registration processes. The attitude part comprises seven questions.

In the last part self adminsterd questoinaire compries of questions related to their practice of quality patient medical records registration processes. This part include open ended and close

ended question. And also questions that assess the work load, their feedback system and general practices of the CHWs on patient recording processes.

The questionnaire was constructed based on the study objectives which were administered in English for CHWs by considering all possible variables according to information developed on the basis of relevant literature.

3.8.2. In-depth Interview

The in-depth interviews were done with focal persons from Addis Ababa Health bureau. The interview focuses on how much of the problem is known by AAHB. The interviews were conducted in private areas using Amharic that is local language of the respondents. The interviews were done by the principal investigator. The interviews were recorded by obtaining the respondents consent to record it. Digital audio recorders were used and re-coded by an assistant. As the nature of qualitative interviewing is flexible, probing were done as necessary so that rich information is gathered during the data collection process. It includes issues such as feedback mechanism and the perception on the practices of patient record registration of the CHWs in each hospitals.

3.8.3. Structured Patient Records Reviews

For structured review check-list were used to assess the real practic of CHWs and the quality of patient record in each hospitals.The patient medical records were reviewed.The review was performed by the principal investigator and assited by two nurses one from MenilekII memorial and another from Zewditu Memorial hospitals.The nurses were given a detailed explanation about the document review processes. More over the explanations includes on data quality dimensions' and on the how to evaluate methods. On top of that, the discussion was continued until they become familiar with the structured document review check-list contents. To avoid bias, nurses were not allowed to do the patient medical records reviewing at the hospital they were working. To access the patient medical records from the shelf stored a clark that who was working regular patient records department staff one from each hospital was used.

The records were picked by taking the list of patient treated with in the first three consecutively months;namly September , October and November of the year 2005 E.C. The logbookes from each hospitals were used to get the list of patients treated in these monthes. Taking the total number of patient treated in the three consecutively monthe in each hospital. Random sampling was used to pick each patient record.The number of documents reviewed from three hospital which is 166. The patient medical records were picked by using Patient Medical Record Number (PMRN) from the logbook. The intial time for search and the final time when it was found or lost reported were recorded for each search as access time. If the patient medical record is not found, It was recorded as lost patient medical records and the next PMRN were piked from the logbook for another search.When the patient medical record is found the time taken to access it was recorded.

3.9. Study Variables

3.9.1. Dependent Variables

- Practice of CHWs on patient medical record recording processes.(primary)
- Data quality of patient medical records

3.9.2. Independent Variables

- Knowledge of CHWs about patient medical recording,
- Attitude of CHWs about patient medical recording,
- Age, Sex, Years of Experience, education level, Monthly salary ,marital status of the CHWs
- Number of patient per day treated, time spent to treating and record single patent medical record,
- Standard format usage, time taken to access, feedback mechanisms, error correction style, completeness, legibility etc.

3.10. Inclusion and Exclusion Criteria

3.10.1. Inclusion Criteria

The research includes CHWs, who have been involved in patient medical recording, storage, retrieval or processing patient medical records and who had at least one year experience in the given hospital at the time of data collection. And who are willing to take part in the process of data collection.

3.10.2. Exclusion Criteria

The research does not include CHWs who were not on practice in the hospitals in the year 2005 E.C. On top of that CHWs who were not on duty in the first three months of the year 2005 E.C. professionals who were not involved in the medical records managements were excluded.

3.11. Data Quality Assurance

To assure quality of the data a standard questionnaire adopted from other related studies were used (Weily , Torres,S , 1987),(Vazziri, Mohsezadeh, 2012). The questionnaire were pre-tested on a sample of 31 Health workers drawn from one of the public hospital (Black Lion Hospital) of Addis Ababa. This hospital was not recruited as a study site. After the pre test modifications and corrections were made based on the findings and on the constructive comments given by participants.Validity of the instrument were examined through face validity, content validity and internal reliability measures.

The comments were collected from the pre-test participants while they return the questionnaires filled were considered as face validity. Based on the comments given modification, amendments on some issues and typographic errors were corrected. For content validity, prior literature, existing instruments and comments from area experts (health information) were discussed the result were considered. Modifications and adjustments were also made on questionnaires based on lessons from the pretest.

After pre-test, reliability analysis of the questionnaire was assessed using SPSS version 20.0. The internal consistency of the tool also assessed using Cronbach's alpha. Cronbach's alpha measures the reliability of the questionnaires and the lower bound for the true reliability of the survey and was found to be 0.70. And items with low Cronbach's alpha were rejected and only those which have 0.70 and grater were taken as reliable(J.C, Bernstein, 1994).

The data collection was supervised by the principal investigator.Strong and supportive supervision by the principal investigator were provided for data collectors on self administered questionnaires at each site while the data was being collected. During supervision consistency and completeness of the data was assessed, and errors pointed out to secure data quality until the required number of questionnaires were collected.

To assess the practical aspects structured document review check list were formulated based on the data quality (dimensions) principles. To assure the data quality the document review were done by the principal investigator and two clinical nurses. The clinical nurses did not involved in the hospital where they do work there daily duty.

For the in-depth interviews structured questionnaires prepared using relevant and related literature. The questionnaire was translated in to local language (Amharic) and it was conducted in Amharic. And the results were re translated into English and grouped in to thematic approaches with the principal investigator.

Quantitative data from structured patient record review check list were entered into Microsoft Excel software version 2007 for clearance and analysis. The data contains both quantitative and qualitative parts. The quantitative parts were presented as percent and frequency. Some of the continues data like time taken to access the patient medical record was given as minimum , maximum, and mean forms.

A code number for the interviewee were inserted on the questionnaire at the start of interview.The qualitative parts were analyzed thematically. Qualitative data from interview were stored using digital audio, organized and analyzed manually. The results have been presented in narration.

3.12. Operational Definitions and Definitions of Terms

Clinical health workers: - are those who treat patients with some procedures and update, modify document with the procedures they had performed on the patient records. Namely, specialist, medical doctors, dentists, health officers, nurses, physiotherapists are considered as CHWs.

Medical record: is the central documentation of the patient's visit to a hospital to get health care services.

Ethiopian Hospital Reform Implementation Guideline: This handbook contains a common set of guidelines to help hospital managers and health providers in steering the consistent implementation of these reformed processes in hospitals throughout the country. Its volume one was published in May 2010. It has different chapters and especially chapter three deals about medical records management.

Knowledge: The knowledge possessed by the Health workers refers to their understanding of any given issue, in this case about the patient medical records registration processes which where explained in the Ethiopian Hospital Reform Implementation Guidelines (FDRoEMH, 2010).And data quality dimensions. Clinical health workers who have scored above mean considered as good and those who have scored below mean considers as poor knowledge(Tegegn Kifel, 2010). ,(Teklehaimanot Mezgebe, 2012).

Self Rated Knowledge : The CHWs rated their knowledge by them self about PMRs registration, error correction processes in relation to the Ethiopian Hospitals Reforms Implementations Guide lines and data quality dimensions .and grouped as low, medium and high.

Attitude: is the degree of positive or negative affect associated with the process of patient medical record quality in the processes of registration. What the health workers felt about patients medical record registration processes, data quality and in relation to its importance.

Positive attitude: a score result above median or above 4.29 (Tegegn Kifel, 2010).

Negative attitude: a score result below median or below 4.29 (Tegegn Kifel, 2010).

Practice: is the activity the health workers in the given hospital in the processes of patient health care services. Moreover it includes the documentation, storage, retrieval, and update of patient medical records and the processes useful information generation as complied with the Ethiopian Hospital Reform Implementation Guideline.

Good practice: score of above the mean in multiple response analysis of practice assessment variables.

Poor practice: score of below the mean in multiple response analysis of practice assessment variables.

Data Quality: is defined as "fitness for use" of the data (also called Information Quality). A single aspect of data quality is defined as a "dimension" such as "consistency", "accuracy", "completeness", or "timeliness" "legibility", "Security" etc.

Access: The ability or the means necessary to read, write, modify, or communicate data/information or otherwise use any information system as a resource. **Or** the extent to which data is available, or easily or quickly retrievable.

Security: a confidentiality practice of controlling the patient medical records information so that only authorized persons could access. "On the need to know bases"

Completeness: is the extent to which the data are not missing. Or, the extent to which the data are sufficient breadth and depth of the task at hand .Or the extent to which the important attributes is recorded in the given form/templates.

Free-of-Error:- The extent to which the forms/ templates are completely written without eras or not erased.

Error Correction Style: The extent to which the error's created on the patient medical records are corrected as the Ethiopian hospital reform implementation guideline orders to do so (FDRoEMH, 2010).

Legibility: Is the patient medical record/ forms or templates recorded were readable by the CHWs. Do any clinical staffs could read the contents written without problem? If they do it is called legible. If not it is called illegible.

Timeliness: The extent or the time it takes to which the data is sufficiently accessed for up-to-date or for the task at hand.

Accuracy: also known as validity. Accurate data are considered correct: the data measure what they are intended to measure. Accurate data minimize errors OR Error free.

Understandability: The extent to which data is easily comprehended.

Patient record lost: When the patient record is searched using the patient medical record number or name of the patient or any patient identifier and not found by the hospital card workers called the patient card is lost.

Template/forms replacement According to the Ethiopian Hospital reform implementation guide line the patient document or forms are labeled on the top of it for which procedure and action it should be used. And if the CHWs identified that label of the form and the content of the form do not much the form is considered replaced.

3.13. Method of Data Analysis and Presentation

The data collected from self administered questionnaire were entered to SPSS Version 20.0 after prepared for analysis. That includes different activities such as checking the data for error, missing values for basic variables, checking extreme values. The questionnaires with missing basic variables were rejected. But some of missing values like age were replaced with mean values.

The questions that assess knowledge have two parts. The first part used to rate the knowledge levels of the CHWs were rated by themselves using three questions. These three questions had four options, very low, low, good, and very good. And the responses given by respondents for their knowledge level was added up. Since the three responses are added in to one the possible result were grouped into three forms. If the sum of the three responses given by a respondent was

below or equal to 6, it was considered as low level. If the sum of the result was 7-9 considered medium level and if the sum is 9-12, was considered as high level (Siamian,2008).

The second part knowledge questions were eleven questions with known answers. These questions were used to assess the knowledge levels of the respondents in relation to patient record registration processes.

The response of the respondents have been re-coded so that high values represents favored/ better knowledge options values in the result. The frequency and the percentile with each questions and options have been presented.

The knowledge level of clinical health workers on patient record registration process were addressed by eleven questions in self administered questionnaires. The mean on knowledge questions were computed and based on the mean those who scored below mean were considered as poor knowledge whereas those who had scored above mean on knowledge question were considered as good knowledge. The clinical health workers who have scored below mean and who had scored below mean on the patient record registration practices 65 or 53.2 % and those who had scored above mean on both knowledge and practices on patient record registration process were 152 or 58.9%. And those who had scored below mean on knowledge and above mean on practices 57 or 46.7%.

The second part of the self administered questionnaires comprises attitude part. These questions prepared for analysis by reverse scoring the values of the response for affirmative or positively stated questions. The options were assigned as follows, one for strongly disagree, two for disagree, three for indifferent, four for agree and five for strongly agree responses. However the negatively stated questions are taken without reversing. There for high values in the result indicates better/favored attitudes.

Descriptive statistics frequencies and percentages for discrete variables, median and standard deviation for continuous variables were calculated. First correlation was done to see the relationship between independent variables. And then chi-square test was done and bivairate logistic regression was used to determine the association between dependent and independent variables. Finally multivariate logistic regressions were used to measure the adjusted associations

between independent and dependent variables. β-scores with 95% confidence intervals (CIs) were used as a measure of the strength of associations. For all statistical tests p-values less than 5% were considered statistical significant.

3.15. Ethical Consideration

The study was conducted after obtaining ethical clearance from the ethical clearance committee of school of public health in AAU. The letter from the ethical clearance committee was communicated to Addis Ababa City Administration Health Bureau (AAHB). Then the AAHB examined and issued letter of ethical clearance. After obtaining a letter from the school of public health and (AAHB) health offices it was communicated to each of the respective Hospitals before data collection time. Finally the permission was secured.

Each participant was well informed about the aim and potential benefit of the study and their written consent and confidentiality was ensured. Data was collected anonymously; names were not needed during data collection and analysis. All the data collected was confidential and was used only for the intended purpose.

3.16. Dissemination Plan

This research will be submitted to school of public health and school of information science.

This research will be disseminated by publishing on pear review journal. And also i will provide one copy to Addis Ababa Health Bureau and for each hospital studied. More over it will be presented to the stakeholders.

4. Result

4.1. Quantitative Study

4.1.1. Socio-Demographic Characteristics of Clinical Health Works

A total of 375 clinical health workers were participated from three public hospitals namely Manlike II Memorial Hospital, Yekatit12 Hospital and Zewditu Memorial Hospitals and the response rate was 97 %. Respondent's age ranges from 19 to 58 years with mean age of respondents 31.42 (SD ±9.43). The mean age of service years was 8 and (SD±8.62) year and ranging from 1 to 38 year. Regarding gender of respondents 57.1% were females and 52.3%, were single 35.8% earns less than 2000 Birr. The respondents are categorized by their educational and majority of them are Diploma graduate nurses that account 40.8% (Table.2)

Table.2 Demographic characteristics of study participant in the selected public hospitals in Addis Ababa, Ethiopia, as of February 2013 N=375.

Variable	**Category**	**Frequency**	**Percentiles**
Sex	Male	161	42.9%
	Female	214	57.1%
Marital Status	Single	196	52.4%
	Married	170	45.5 %
	Divorced	5	1.3%
	Widowed/Widower	1	0.3%
	Separated	2	0.5%
Monthly Salary in Birr	<2000	133	35.5%
	2001-3000	121	32.3%
	3001-4000	93	24.8%
	>4001	28	7.5%
Education Level	Specialist	17	4.5%
	General practitioner	66	17.6%
	Dentist	6	1.6%
	Health officers	24	6.4%
	B.sc Nurse	109	29.1%
	Diploma Nurse	153	40.8%

4.1.2. Knowledge of Clinical Health Workers

To the question, "what do you think about the importance of patient medical data quality in relation to continuity of care?" 16(4.3%), of participant said that not important 42(11.2%) said important, and 317(84.3%) said it is very important.

Knowledge rated by the participants about themselves were found to be low level 33(8.3%), medium level 263(70.1%) and high level were 81(21.6%) of the clinical health workers.

Regarding the perceived challenges and perceived solution of quality patient medical record in the hospitals, 52.5% of the respondents mentioned work load was sated as a main challenge, followed by 42.9%.of the respondents mentioned lack of Knowledge of health workers about importance of patient medical record were stated as main challenges. The main perceived solution to solve the problem given by respondents' was increasing leadership quality of the hospital administration 56.8% of the respondents followed by automating the health management information system 41.9% of the respondents (Table.3).

Table.3 perceived challenges and solutions given by the study participants in Addis Ababa, Ethiopia, as of February 2013, N=375

Variables	Options	Yes
Perceived Challenges	Work load of each health workers.	197(52.5%)
	Lack of Knowledge of health workers about importance of patient medical record registration processes.	161(42.9%)
	Lack of supervision on performance.	146(38.9%)
	Lack of Leadership quality of the leaders.	118(31.5%)
	Lack of automation of the system.	113(30.1%)
Perceived Solution	Increasing leadership quality of the hospital administration.	213 (56.8%)
	Automating the health management information system.	157(41.9%)
	Motivating the health workers by increase salary	152(40.5%)
	Giving on job training for health workers.	149(39.7%)

To the question" Do you think that patient complaints should be written in the patient's own words?" 38.0% do not know if a patient's complaints should be written in the patient's own words. And 26.1% of the respondents do not know the presence of the Ethiopian Hospital Reform implementation Guideline in their hospitals. Regarding the error correction style those who know the correct procedures as the guide line suggests are about 69.7% and those who do not know the correct procedures on error correction styles are about 29.3 %.(Table.4)

Table.4 Knowledge level of study participants in frequency and percent on the study, in Addis Ababa, Ethiopia, as of February 2013, N=375.

Questions	**Yes Frequency and Percent**	**No Frequency and Percent**
Is there any guideline that the hospital follows to register patient medical records?	277(73.7%)	98(26.1%)
Do quality patient medical recording helps in resource allocation and planning in hospital?	327(87.0%)	46(12.2%)
Do quality patient medical recording helps in any public health action?	315(83.5%)	60(16%)
Do you think the data you collect fits for the purpose of the hospital?	273(72.6%)	100(26.6%)
Do you think that legible hand writing is important to keep data quality?	305(81.1%)	70(18.8%)
Do you think incomplete patient medical record registration is associated with any form of adverse event?	269(71.5%)	106(28.2%)
Do you think that, patients have the right to handle their medical records without the assistance of health workers?	94(25%)	281(74.7%)
Have you ever heard of patient medical records security?	238(63.3%)	123(32.7%)
Those who know the appropriate error correction style from different options (yes) ,and who do not know (No)	262(69.7%)	110(29.3%)
Do you think that patient complaints should be written in the patient's own words?	232(61.7%)	143(38.0%)
Do you know the recommended ink type for patient record registration?	339(90.2%)	35(9.3%)

4.1.3. Knowledge of Health Workers with their Profession and Sex

The crosstab for knowledge (as poor and good) with participant's sex, education levels were done. Their frequency and percent were presented.

29.8 % males have poor knowledge on patient record registration process and it is less than females. Regarding knowledge of clinical health workers general practitioners have scored the highest score as compared to other education level 90.1%, specialist 58.8% and 66.7% of dentist scored above mean or good knowledge on patient record registration process. (Table.5)

Table.5 Cross tabulation of Knowledge level with sex and education level of participants' on the study, in Addis Ababa, as of February 2013, N=375

Independent variables		Knowledge by mean		Total
		Below mean (7.94)	Above mean (7.95)	
Sex	Male	48(29.8%)	113(70.2%)	161
	Female	73(34.1%)	141(65.8%)	214
	Total	212	254	375
Education level	Specialist	7(41.1%)	10(58.8%)	17
	General practitioner	6(9.9%)	60(90.1%)	66
	Dentist	2(33.3%)	4(66.7%)	6
	Health officers	11(45.8%)	13(54.2%)	24
	B.Sc. Nurse	36(33%)	73(67%)	109
	Diploma Nurse	59(38.7%)	94(61.4%)	153
	Total	121	254	375

4.1.4. Attitude

The attitude of the clinical health workers towards patient records registration process was assessed by using five scale measurements. The median was used to categorize the attitude of the participants. And therefore the whole CHWs attitude was categorized as low and high or poor and good by using the median. And 176(46.9%) of the participants have scored below median or as unfavorable (poor) attitude towards patient record registration process. And 199(53.1%) of the participants have showed favorable (good) attitudes towards patient record registration process.

Regarding the attitudes of the CHWs in relation to their profession was computed. And 70.6 % of the specialists and the next 50.0% Dentist were showed unfavorable (poor) attitude towards patient record registration processes (Table .6)

Table.6 Cross tabulation of attitude of participant with their profession on the study, Addis Ababa, Ethiopia as of February 2013, N=375.

Profession	Attitude Scored in percent	
	Below Median	Above Median
Specialist	70.6%	29.4%
General practitioner	42.4%	57.6%
Dentist	50.0%	50.0%
Health Officers'	37.5%	62.5%
B.Sc. Nurse	47.7%	52.3%
Diploma Nurse	47.1%	52.9%

4.1.5. Practices

Question for total practices were listed in Table.7. It was categorized as poor and good practices using mean as cut-off point. Those who have scored above mean have good practices and those who scored below mean have poor practices. Therefore 165(44.1%) of the respondents were scored below mean or as poor practices. And 209 (55.9%) of the respondents' scored above mean and considered as good practices on patient medical record registration process.

Table.7 Practice on patient medical records registration by Frequency and percent on the study, Addis Ababa, Ethiopia, as of February 2013, N =375

Items	Frequency and percent	Frequency and percent
	Yes	No
The responses' for the question do you collect feedback about your performance on patient medical record quality and validity and result shows	161(42.8%)	209(55.6%)
Do you ever discussed formally with the other health workers to evaluate the effectiveness of patient's medical recording processes in this hospital?	207(55.1%)	160(42.6%)
Do you put your name, signature & your title on the space provided after you write data on patient medical records, for which you are responsible?	305(81.1%)	59(15.7%)
Do you protect the confidentiality of patient's medical records protected properly(only accessed on need to know bases)	262(69.7%)	91(24.2%)

The workloads of the CHWs were considered based on the number of patients they give treatment at their specific departments per day as perceived. Minimum number 12, Maximum 60, numbers of patients served by a CHWs and mean of 29. And (SD $\pm$ 9.05), N=375.

The average time spend in treating the patient and writing the record of a single patient while giving treatment. (In minutes) were reported, the Minimum is 9', Maximum 35' and Mean 15.8' (SD$\pm$6.2). N=375.

Regarding the feedback collection on their performance about patient medical record quality and validity were asked. Thos who have said "yes, we do collect feedback", were 42.8%. (Table.7)And for the question that asked about source of feedback and the frequency of the feedback collection (how often). For the source the feedback about their performance on patient medical record quality and validity, as mentioned 16.5% get from hospital administrators' 12.6% get feedback from patients, 7.5% get feedback from staff members,6.3% get feedback from Addis Ababa Health bureau, 5.4% of the HWs' get feedback from NGOs, 3.9% get feedback from FDREMoH and 1.8% get feedback from the hospitals' health care service quality officers.

As the frequency of feedback collection on their performance about patient medical record quality and validity was reported as 24.5% said ‘no regular time’, 23.7% said ‘Daily’, 15.4%, said “Monthly’, 7.7% said ” Weekly”, and 0.8% of participants had said yearly.

For the question “Do you think all important data of the patent will be recorded properly in this hospital?” Yes 145(38.6%) and No 230(61.2%) with N 375.

For the question “Do you have formal discussion with your colleagues to evaluate your performance/effectiveness of patient record registration processes?”Among the respondents 42.6% said no and justified their reason (Table.7).

The reason for not to have formal discussion were reported as, Grand majority of the respondents reported that*:-“The hospital system does not have communication channels among the hospital staffs to gain such experience from senior staffs.“* Some others Says*” I know little about patient medical recording process. “Some* others say*:-“The patient medical record is the responsibility of medical record office employees and no one will give much due attention for such activity.”*

Some others say*: “Due to shortage of human power and work load is very high on top of that as fresh clinical health worker’s I know little about the whole patient medical recording processes.”*

For the question asked “Have you ever had on job training in any form on patient record registration processes?” 43.6% of the respondents said yes and 53.7% of them said No to the question. The reason for not to have on job training as perceived by the CHWs, vast majority of the respondents said that: - *“I did not have the chance or opportunity to attain any on job training.”*

One of the respondents said “ *I had only a single training in my twenty years of services in the same hospital that was three years back form know .“*

Some also said that “*it is because of the weakness or the problem of the hospital management to make on job training available for staff members but we couldn’t have it yet* “

The respondents also asked if they put their name, sign, there title on the space provided after they had written any entry in the patient’s records. Among the respondents who had side no were 15.7% and they justified their reason as follows:- Significant number of the respondents associate with workload, one respondent said *“The workload do not allow us to do such things “*

Some others said *"I do not know the value or the importance to write such things on the patient medical records* "and also some others said that "*There is no space on the forms (format) we use in our ward therefore we do not sign, or write our names "given* as a main reason to justify why they did not write their name, sign, title (initial) on the space provided for the data they are responsible.

4.1.6. Clinical Health Workers with their Profession and practices

The practices of the CHWs based on their profession (education level) were presented as below mean or poor and above mean or good practices scored in this study. Therefore 79.2% Health officers, 62.1% Diploma nurses have scored good practices. And the highest proportion of CHWs with poor practices or below the mean were 66.7% Dentists, 65.2% Medical Doctors, and 64.7% Specialist (Table.8)

Table.8 Practices of respondents with their education level on the study, Addis Ababa, Ethiopia, as of February 2013, N=375,

Education Level of H.W	**Percent of H.W for Practices Scored**	
	Below Mean	**Above Mean**
Specialist	64.7%	35.3%
General practitioner	65.2%	34.8%
Dentist	66.7%	33.3%
B.Sc. Nurse	40.7%	59.3%
Diploma Nurse	37.9%	62.1%
Health Officers'	20.8%	79.2%

According to the crosstab result of independent variables with dependent variable was shown. And good practices of male participants on patient record registration processes is 60.5%, only 39.5% male have shown poor practice (Table.9)

Regarding the attitude of clinical health workers of 48.9% them unfavorable attitude and poor practices on patient record registration processes. And also 53.2% of the clinical health workers have scored poor knowledge and poor practices on patient record registration process (Table 9).

Table.9 Cross tabulation practices of participant with their sex, attitude and knowledge of study participant, in Addis Ababa, as of February 2013.

Independent variables	Total practices by mean(Dependent)		
Sex	Poor practices	Good practices	Total
Male	64(39.5%)	98(60.5%)	162
Female	102(47.9%)	111(52.1%)	213
Total	166	209	375
Total Attitudes			
Below median(Unfavorable Attitude)	86(48.9%)	90(51.1%)	176
Above Median(Favorable attitude)	80(40.2%)	119(59.7%)	199
Total	166	209	375
Mean on Knowledge			
Below mean(<7.94) (Poor Knowledge)	65(53.2%)	57(47.8%)	122
Above mean (>7.95)(Good Knowledge)	102(40.2%)	152(59.8%)	254
Total	167	209	375

4.1.7. Association of Independent Variables with Dependent Variable (Total Practice)

All of the independent variables did not show an association among each other as tested by correlation. And also chi-square test was done to identify the association of dependent variable with the independent variables.

Total knowledge level of clinical health workers on patient record registration process by taking its mean, sex of participants, age of participant and education level were independent variable those who have shown statistical significant association with practices on patient record registration process.

According to the result from cross tabulation/chi-square test, Age of the participant has shown statistical significant association with the practices of the clinical health workers on patient record registration processes. The result shows Pearson chi-square (X^2= 9.764, df= 3, P= 0.021) (Table 10).

Knowledge level of the clinical health workers on patient record registration process has show statistical significant association with the practices of the clinical health workers on patient record registration processes. The result shows pearson chi-square test(X^2=5.747, df=1, p-values = 0.017) (Table 10).

The result from chi-square analysis has also shown sex of the study participants have statistical significant association with the practices of clinical health workers on patient record registration process with pearson chi-square test (X^2= 3.017, df=1, P-value = 0.042) (Table 10).

The result from the chi-square analysis has shown education level is associated with the practices of patient record registration of participants with pearson chi-square values (X^2=24.009, df=5, P-value =0.0001) (Table 10).

As it can be seen from the cross tabulation/chi-square test (Table.10) in dependent variables like attitudes of the participants towards patient record registration process with pearson chi-square test (X^2= 2.841, df= 1, p-value = 0.092),experience on patient record registration process with pearson chi-square test (X^2= 0.701, df= 2, p-value = 0.704) and marital status of the participant with Fisher's Exact test (x^2= 0.558, df=4, p-value = 0.195), Fisher's Exact Test was taken because 6 cells (60.0%) have expected count less than 5 and monthly salary were independent variables that do not shown statistical significant association with the total practices of the patient record registration process (Table 10). Workload of the participants was considered in the form of the minimum and maximum number of patients served by the participants' in a given department of the hospitals. However; workload of the study participants' also does not showed statistical significant association with the practices of clinical health workers on patient record registration processes (Table 10).

Table.10 Cross tabulation of practices of participant on patient record registration with independent variables of the study, In Addis Ababa, as of February 2013.

Variables	Categories	N	Practices	Chi-square Type	X^2	df	P-values
			Good Practices				
Sex	Male	161	98(60.9%)	Pearson Chi-Square	3.017	1	0.042
	Female	214	111(51.9%)				
Regrouped age	<25	90	51 (56.7%)	Pearson Chi-Square	9.764	3	0.021
	25-34	172	98(57.7%)				
	35-44	64	26(40.6%)				
	>45	49	34(69.4%)				
Knowledge by mean (7.94)	less than 7.94	122	57(46.7%)	Pearson Chi-Square	5.747	1	0.017
	greater than 7.95	254	152(59.8 %)				
Attitude by median	Less than Median	176	90(51.1%)	Pearson Chi-Square	2.841	1	0.092
	Greater than Median	199	119(59.8%)				
Minimum No of Patient Served (by mean)	Below Mean		100(54%)	Pearson Chi-Square	0.346	1	0.557
	Above Mean		109(57.1)				
Maximum No of patient served (By mean)	Less than Mean (34)	179	96(53.6%)	Pearson Chi-Square	0.528	1	0.467
	Greater than mean (34.5)	197	113(57.4%)				
Recoded experience	1 Year	68	45(52.3%)	Pearson Chi-Square	0.701	2	0.704
	2-4 Years	108	63(58.3%)				
	>4 Years	181	101(55.8%)				
Marital Status	Single	196	115(58.7%)	Fisher's Exact Test **	0.558	4	0.195
	Married	171	91(53.2%)				
	Divorced	5	2(40%)				
	Widowed/er	1	0				
	Separated	2	0				
Education level	Specialist	17	6(35.3%)	Pearson Chi-Square	24.009	5	0.0001
	Medical doctors	66	23(34.8%)				
	Dentist	6	2(33.3%)				
	B.s.c Nurse	109	64(58.7%)				
	Diploma Nurse	153	95(62.1)				
	Health officers	24	19(79.2%)				

** Fisher's Exact Test was taken because 6 cells (60.0%) have expected count less than 5

The independent variables those who have shown statistical significant association with chi-square test were assessed by using bivariate and multivariate logistic regression. Using Bivariate logistic regression the knowledge level of the participants' result again shows with β= 1.699, P-value 0.017, 95% CI EXP(β)(1.100, 2.626), sex of the participants' with β= 1.443, P-value 0.05, 95% CI EXP(β)(0.953, 2.994) , and education level have shown statically significant association with total practices (Table 11). Even though the regrouped age has shown statistical significant association with chi-square test, it has shown no statistical significant association with bivariate logistic regression with practices of clinical health by considering the first group(age <25) as constant.

Table.11 Bivariate logistic regressions of independent variables with practices of the study participant's, in Addis Ababa , as of February 2013,

Independent variables	P-value	Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
Total knowledge by mean (below mean)	*1			
Total knowledge by Mean(above mean)	0.017	1.699	1.100	2.626
Female	*1			
Male	0.05	1.443	0.953	2.186
Specialist	*1			
Medical doctors	0.973	0.981	0.321	2.994
Dentist	0.931	0.917	0.128	6.556
B.Sc. Nurse	0.078	2.607	0.899	7.566
Diploma Nurse	0.040	3.003	1.054	8.555
Health officer	0.007	6.967	1.718	28.251
Regrouped Age < 25	*1			
Regrouped Age 26- 34	0.962	0.013	0.605	1.694
Regrouped Age 35- 44	0.51	0.523	0.273	1.002
Regrouped Age >44	0.27	0.830	0.830	3.621

Finally multivariate logistic regression with backward stepwise method was done for those independent variables that have shown statistically significant association with total practices while assessed using bivariate logistic regression. And almost all similar result was found with that of bivariate logistic regression except for regrouped age of the participants.

According to the result found from multivariate logistic regression participant who have good knowledge have shown statistical significant association with β=2.301, P-value=0.001, 95% CI EXP(β)(1.400, 3.780),this implies that those who have good knowledge level 2.3 times had good practice than participants who have poor knowledge (Table.12).

In relation to gender and practices on patient record registration process. Males have shown statistical significant association with β=1.832, P-value=0.009, 95% CI EXP(β)(1.160, 2.893), This also means that males have 1.83 times good practice than females (Table.12). Likewise education level statistical significant association were found for health officers, diploma nurses and B.Sc. nurses only as compared to specialists (Table.12).

From multivariate logistic regression the health officers show 10.3 time good practices than specialists, the diploma nurses have 3.6 times good practices than the specialists. And also the B.Sc. nurses have shown 3.32 times good practices than the specialists. Even though, General practitioners, Dentists and Specialists have good knowledge on patient record registration processes their practices is poor as compared to other clinical health workers like Health Officers, Diploma Nurses and B.sc Nurses (Table.12).

Table.12 Multivariate logistic regression with total practices for the study participants in Addis Ababa, as of February 2013.

Independent variables	P-valu	Exp(B)	95% C.I.for EXP(B)	
			Lower	Upper
Total knowledge by mean (below mean)	*1			
Total knowledge by Mean(above mean)	0.001	2.301	1.400	3.780
Female	*1			
Male	0.009	1.832	1.160	2.893
Specialist	*1			
Medical doctors	0.557	.698	.209	2.324
Dentist	0.952	1.065	.134	8.442
B.Sc. Nurse	0.040	3.324	1.057	10.456
Diploma Nurse	0.026	3.583	1.161	11.064
Health officer	0.003	10.305	2.223	47.784

4.2. Document Review

Access time taken for a given patient record when it was searched by its patient medical record number was reported as, minimum 41 second, maximum 60 second and average 56 second.

Patient medical record (Cards) lost or not found on their places at patient record review time are reported as 36/166 which is 36(21.7%) of the patient cards are lost or not found on their place.

Patient records reviewed were found that they had accessed services from outpatient department (OPD) 117(71.34%) and inpatient department (IPD) 47(28.65%) out of 166 reviewed patient medical records. To determine the data quality of the selected hospitals describing some of the data quality dimensions might show the situation. From the reviewed patient records 95.1% are incomplete. Regarding error correction style 88% of the errors created were not corrected as the Ethiopian hospital reform implementation guideline order. Regarding the standard format usage 42.2% of the patient records were replaced with any rough papers. More over 80.4% of the patient record (Table.13)

Table.13 Patient record reviewed using check list on data quality dimensions at selected hospitals, in Addis Ababa, Ethiopia ,as February 2013,

Item	N	Frequency and percent	
		Yes	No
Is patient MR has PMRN on its place?	166	144(87.8%)	22(13.3%)
Is all Demographic information complete?	166	135(82.31%)	31(18.7%)
Is all existing forms filled completely?	166	8(4.9%)	157(95.1%)
Is there any forms replaced by other sheet of paper?	166	70 (42.2%)	95(57.8%)
Is the hand writing legible enough for clinical health workers?	166	132(82.5%)	32(19.25%)
Do they write the date and signed on the space provided?	166	33(19.8%)	133(80.4%)
Are the forms free from error?	166	116 (69.87%)	50(30.1%)
Do they follow the guide line to correct errors?	50	6/46 (12.0%)	44(88%)

MR= Medical Record, PMRN=Patient Medical Record Number

The demographic information supposed to be recorded for all types of health care services (OPD or IPD) given in the hospitals. However; the result showed 18.7% patient records had incomplete demographic information. Part of the demographic sheet like facility name, age of patient, patient's grandfather name, patient medical record number and patient address such as telephone number were missing from demographic, more over some patient medical records demographic format were missed in the demographic sheet.

To check completeness of the patient record which form was incomplete and which parts or attributes of the forms were incomplete were addressed in the patient record review check list. Thus out of 166 patient records from three selected hospitals the following forms were found to have incomplete documentation and also the parts or attributes which are missed commonly were listed as follows.

History and physical examination assessment form out of 166 forms reviewed 68(42.2%) of the forms were either they have missed one or more of the following contents of the form. Namely; Patients medical record Number (PMRN), Patient's Name, Sex, Age of the patient and

title name and signature of the clinical health workers who is responsible to write on the form were missing.

Hospital summary sheet of all visited dates form: This form is found on the second page of the patients demographic forms. Out of 166 forms 100 (60.97%) of them have missed all the content of the form.

Consent forms:- From 47 admitted patients 23 consent forms were found from all patient record review. Out of the 23 consent forms found 18 of them were found to be written at the back of the patient medical card or at the back of any form or patient records. Most of the consent form has missed the date. In some of the patient records operation note are found which implies operation had been done for particular patient it is a must to take the patients consent or Keene consent's. However, since it is not found it has been considered as missing.

Physician order sheet Out of 166 the patent medical records observed both from outpatients department and inpatient department services 18 of them are found to be incomplete. Most of the physician order sheet has missed different attributes. Like Patient Name, patient age, patient sex, patient medical record number, ordered by, ordered date, Sign and date are missed in combination with one another.

Progress Note: Four forms were found incomplete by missing name, age, sex of patient and medical record number (PMRN) was missing. The signature, initial or name and date of the records were not recorded.

Intra partum care and follow up And Antenatal labor delivery care: Four forms from were found incomplete. Parts missing on the form are patient name, admitted time, time of amnion membrane ruptured, follow up time were among attributes found incomplete.

Discharge summery Sheet: Five discharge summary sheets were found incomplete. The discharge summary ought to be recorded and placed document in the patient medical record when the patient leaves the hospital. The discharges must include the last states of the patient [1]. However; three patient documents showed that the patients were admitted but the discharge summaries were not found and two were found incomplete. Attributes like signature, date and initial of the discharging clinical health personnel were missed.

Regarding the forms or templates replaced with any rough paper or other forms were found to be 70(42.2%). Among these, forms like Hospital &Physical examination assessment forms 45(27.43%), 8 Physician order sheet,5 Consent form these are used at the back of patient card, 3 Medication Administration forms, 2 Hospital progress note, 2 Operation note, 1 Vital sign recording form, 1 Hospital discharge summary form were among some of the replaced types of records.

The patient record review result shows out of 166 patient record reviewed 50(30.1%) forms found with errors or errors crated during patient record registration. And only 13.0% of the errors were corrected as the Ethiopian Hospital Reform Implementation Guideline order (FDRoEMoH, 2010). This implies that 30.1% of the recording processes were with error and out of the errors created 86.95% of the errors created were not corrected as the guide line orders.

Taking the responsibility about the documents produced by the author (the clinical health workers) who write in the patient record might be expressed by writing the initial title, date at which the record was created and signature of the author are expected to be written on the space provided on the forms. However 133(80.6%) of the CHWs did not showed to practice this act on the reviewed patient records. Or only 19.4% of the records were showed to practice this act of taking responsibility about the documents or the data they have produced.

Nursing processing forms:-This includes nursing admission assessment forms, nursing problem statement list, nursing care plan and nursing patient progress reports forms were examined. Out of the 47 admitted patients in the three hospitals all were supposed to have the nursing processing forms. Only 13(27.65%) of them are found from the that only 2(4.25%) of them were completely recorded the other 11 either completely empty or missed, like date, sign weight, age temp, respiration are missed and some others were used other format or rough paper.

4.3. Interview Results

The interviews were conducted with two people from Addis Ababa health bureau as focal person by the notion that their job is the study. The questions and their answers were presented as follows:

For the question "How do you evaluate the data quality at patient medical records registration processes in the hospitals administered by AAHB?"

Both of the respondents have similar idea *" Currently it has becoming better as compared to 3 years back ,previously the reporting mechanisms were program specific and the attentions and the performance depends as the importance of the program. The improved things regarding the patient records are all medical records are integrated at all hospitals at one center, usage of guide lines to make standardized and also there are health management information system focal person at all hospitals with all its limitation on the performance."*

Do you give feedback to the CHWs (General practitioners', Health officers, Nurses etc) about the data quality and the importance of the data they collect? Were asked they conveyed similar ideas.

R1 said "We communicate them when there is improper data report from the hospital to our office especially when we find extreme values or unexpected reports from the hospitals using telephone the reported body"

R2 said "we communicate them when we get irregularity of reports for instance if they reported unexpected disease case and let them make a correction but we only communicate the clinical health workers when we give support or on different meeting "

For the question "Did the Addis Ababa health bureau ever arranged on job training on the patient medical records for CHWs? If yes how often? "Both independently responded the same event happened once.

R1 said that *"As the best of my knowledge an intensive training were given on HMIS in 2001 which was before 4 years back once for all clinical health workers except the new hospital which Tiruneshi Beijing. And also training for trainees were given. But it was not continued "*

R1 said that "A *training was given almost for all CHWs during the implementation of smart care and also single training was given for the trainers of trainees for two health workers from each hospital to make an update or to give on job training for new comers."* Both of the respondents have similar idea on that but they differ on the implementation of the trainers at each hospital one the respondent says *"But I don't think these groups were actively working. "*

And the other said, that *"I believe that they are doing well"*, and also the other respondent Said that *"all CHWs need refreshment training but to give additional training there is a limitation of budget"*

For the question "What do you think the challenges that hinder you from improving the patient records quality at these hospitals?" R1 said that *"There is high turnover in the patient record departments at each hospitals; I think this is because of the dissatisfaction with the salary scale. And also there is an attitude the leaders that considering the patient record department as punishment site (area) in the hospital .They send workers to this place when they think that the worker has bad work habit.*

R2 said that "The card format are too much in number filling all will takes time these were considered as major problems and also i think the CHWs are less motivated to record information completely".

For the question "What are the solutions you suggest to solve the problems? " One of the respondents (R1) said that *"The patient record department workers should be recruited based on sufficient standard that fits to the job and they should have sufficient development hierarchy to reduce the turnover."*

R2 said "There is no budget specifically allocated to HMIS activity at AAHB level and there is shortage of budget and higher official give less attention to data quality. I also believe that the human resource management at hospital level is the big challenges to bring change towards good attitude that of the HWs' in using standardized tools and also there were no supervision to implement the standards. Even though I don't want to comment on the leadership quality of the hospital management, because the hospital managers are handpicked by the government based on different criterion, which I suspect there is limitation in planning to make available the logistics needed to the hospital. This could be considered as one challenge and working on this may change things "

Both respondents agree that" *attention should be given for data quality at every level of the health care stages and the political leaders as well as office holders should give sufficient attention for data quality. Besides that the HW's should know the importance of documenting their works."* Moreover R1 said *"I believe that the colleges and university that produce health professional should include in their education curriculum efficient relevant content of the HIMS. And also AAHB should allocate sufficient budget for data quality and to have regular training*.

On top of that as to the investigator in the three hospitals there were shortage of HMIS format in the hospitals and also in three of them there is no photocopy machine at the patient record departments. In all examined hospitals the patient index card were not arranged alphabetical. Except Menelik II memorial hospital the computers were not functional at both Yekatiet 12 Memorial and Zewditu hospitals at data collection time because of miner problems.

5. Discussions

This study revealed mainly the following. 53.2% clinical health workers have shown poor knowledge and poor practices on patient record registration processes. Even though 40.2% of clinical health workers have shown good knowledge on patient record registration they have poor practices on patient record registration process. Moreover, from the components asked majority of the respondents showed that they do not know if a patient's complaints should be written in the patient's own words or rephrased and they account 38.0% followed for the question asked if the participants ever heard of patient records security? Among the total 32.7% out of the total clinical health workers reported that they have never heard of patient records security. However, question on issues such as "Do quality patient medical recording helps in decision making?" were responded correctly by 327(87.0%) of the respondents. And also issues such as "Do quality patient medical recording helps in any public health action?" were answered correctly by 315(83.5%) of the respondents.

According to the research done by Tegegn in Ethiopia in 2010 reported that, the overall knowledge on HMIS basics concept was found to be relatively good. And about 70.6% of the respondents' were found to have good knowledge (Tegegn Kifle, 2010). Another research from Tanzanian by Nyamtema, on 25 June 2010 reported that, 81% of the respondents had never been trained on HMIS, 65% did not properly define even the term Health Management Information System (Nyamtema, 2010).

The attitude of CHWs towards patient record registration process in the selected hospitals has showed mean 4.09 (SD$\pm$ 0.428) and median 4.29. Out of the CHS under study 176(46.9%) of them showed unfavorable attitudes towards patient record registration and 199(53.1%) of them showed favorable attitude. According to the research done by Tegegn on July 2010, reported that from all respondents 81.1% of them had favorable attitude towards HMIS(Tegegn Kifle, 2010). On top of that a study from Tanzanian by Nyamtema, in 2010 reported that the attitudes of the health workers almost all respondents (91%) had positive attitude towards HMIS (Nyamtema, 2010).

And as compared to the other studies the attitude of the CHWs towards patient record registration is poor. It was only 53.1% of the participants had scored above median as good attitude. This attitude result in study show additional effort should be done to bust the positive attitude towards the patient records registration processes. These significance discrepancies among their attitude also may come from the difference of study population or may be difference in tools used.

Regarding the practices of the CHWs in relation to patient record registration process were found that 55.9 % of them have good practices and 44.1% of them are found to have poor practices on patient records registration process.

Among the CHWs with their profession those who had good practices 79.2% of health officers and 62.1% of the Diploma Nurses had good practices. Moreover, from those who had poor practices 66.7% of them were Dentists, 65.2% of them were Medical doctors and 64.7% of them were specialists. According to the research finding reported by Tegegn, states that the practice of health workers is only 20.6 % of them were good practices towards health management information system(Tegegn Kifle, 2010). .According to similar research from Tanzanian on 25 June 2010 reported that, It was explained as 42% the respondents had never used the HMIS data collected at the health facility level for planning, budgeting and evaluation of services provision.70% of the participants did not use data for analysis. And also major reasons for failure to utilize the local data were poor quality of data and poor managerial skills reported by 16% and 7% of the respondents respectively (Nyamtema, 2010).

When we compare the results of practice from Tegegn's research 55.9% good practices seems to be better than 20.6%. But 44.1% of the respondents were found to have poor practices towards patient record registration processes. This show significant number of CHWs had poor practices. Only 55.9 % CHWs had good practices towards patient record registration process.

On top of that when the results on the total practices compared among themselves those with relatively high educational qualification had poor practice on total practices towards patient records registration processes. This may be explained as, they might not have training on the Ethiopian Hospital implementation guideline or insufficient knowledge to bring practices, or

they may be reluctant to follow the guideline as business rules might be considered as possible reason (FDRoEMoH, 2010).

Results from patient record review might explain the real practices and data quality levels. About 42.2% of the patient forms either missed one or more parts of its attributes or contents were missing. Contents of the form like patient medical record number, patient's name, and sex, age of patients and /or signature of the CHWs, title and name of the CHWs who is responsible for what has been written by them were missed. Moreover 78.3% of the consent forms were found to be written at the back of any patient medical record that is unstandardized format.

As it can be seen from the knowledge, attitude and practice parts figures were presented. But what matters is how much of the knowledge of CHWs bring an impact on the practices of the CHWs on patient record registration processes becomes better. And what kind of the attitude will create an impact on the practice will be addressed in the association section.

The other factor considered was perceived work load of the CHWs were considered based on the number of patients they give treatment at their specific departments per day. Mean of 28.93 number of patients served and (SD $\pm$ 9.05). And the average time spend in treating a single patient and writing its record while giving treatment(in minutes) were reported as the Minimum is 9', Maximum 35' and Mean 15.8' (SD$\pm$6.2). According to the study from university of Ottawa Ontario, Canada in paper documentation by physician for non-traumatic chest pain were examined. The result shows that it takes mean 6.1' (SD$\pm$2.5) to complete medical records for paper based (J, Perry, 2013). When it is compared with mean results found from this research which is mean 9'(SD $\pm$6.2) compared and that of the paper report which 6.1' (SD$\pm$2.5) implies that it still takes more time and needs improvement in the processes.

Regarding the importance of the patient records majority of the respondents were said that it is "Very important" 317(84.3) N =375. As compared to the study from Tanzania 54% of the health workers respondents' did know who are supposed to use the information collected at the health facility, 40% of them didn't know the importance of HMIS(Odhiambo-otieno,George, 2005). Another study in Tunisia, in 2010 reported that considering the importance of medical history sheet on diagnosis of diseases and subsequent treatment, it is necessary all of the students complete it properly. In this regard, 41.4% of trainees were good and 50% were moderate (Cradock, A.Y, 2001).

Reports from patient record (Document) review revels that out of the 166 document included in the review were 117 (71.34%) of them accessed from outpatient department (OPD) service and 47(28.65%) were from inpatient department (IPD) service by chance(randomly).

In relation to patient record completeness in this study from the exiting forms 157 out of 166 forms or 95% of them are incomplete from those incomplete parts twenty nine or 17.68 % of them either two or more parts in combination were missed from the demographic information parts. Among these demographic part most missed the patient medical record number (Record Identifier) were missing.

From the other type of forms like patient history and physical examination assessment form 42.2% of the forms either missed two or more part of the following contents are patients medical record number (PMRN), Patient's Name, Sex, Age of the patient and title name and signature of the CHWs who are responsible to write on the form. From other forms 23 consent forms were found from all patient record review. Out of the 23 consent forms 78.26% of them the consent forms were found to be written at the back of the patient medical card or at the back of any form or patient records. And also some misses the date. In some of the patient records operation note are found which implies operation had been done for particular patient it is a must to take the patients consent or Keene consent's. However, since it is not found it has been considered as missing or not taken.

And also another important patient document such as Discharge summery Sheet from patient documents showed that the patients were admitted but 3 discharge summary were not found and 2 were found incomplete with attributes like signature, date and initial of the discharging CHWs personnel were missing. According to the other studies reported about absences of record component were associated with lower rates of adverse events, and that missing record components lead to an underassessment of adverse event in record review studies. In contrast, poor quality of the information present in patient records was associated with high rates of adverse events. They concluded that evidence-based standards format for record keeping are necessary for standardization of recording patient information(MARIEKE ZEGERS,2011). According to the research most common type of HMIS booklets 55% of them were never filled (Nyamtema, 2010).

More over quality improvement projects, research, and legal issues all rely on a complete accurate record. Coding, billing, and reimbursement depend on accurate documentation in specific hospital(de Klerk,1993).There for incomplete medical record hampers not only the health care activities but also other related services like the research, judiciary system will be affected.

Regarding the forms or templates replaced with any rough paper or other forms were found to be 70 (42.2) of records were replaced with rough paper out of the total 166 observation. Among these forms replaced with rough paper, Hospital &Physical examination assessment form makes up 45(27.43%). This implies that replacing the standardized data collection tool with rough paper or unstandardized tools or this act will create impairments for the data quality and missing attribute. The research done by Tegegn supports this idea bay stating that, unstandardized format usage for data collection and reporting purposes were the underlined factor for poor data quality at the health center(Tegegn Kifle, 2010). In addition to that as it was explained in the literature section on (Mekonnen Wagaw ,2009) , (Mesert Ayano, 2009),(MARIEKE ZEGERS,2011).Usage of standardized format is one of the technical determinants for data quality factors.

Errors freeness out of 166 documents reviewed 50 or 30.1% of the records found with errors and out of 50 patient records with errors only 6 or 12% of them were corrected according to the Ethiopian Hospital Reform Implementation Guideline orders(FDRoEMoH, 2010). However out of the patient records with error 40 or 86.95% of the patient records were corrected in informal ways or were not corrected according to the HERIGL orders (FDRoEMoH, 2010). According to a research conducted in Dutch hospitals reported that data quality or error will be associated with adverse event occurrence (MARIEKE ZEGERS,2011). This shows that if errors were not properly handled it will impair the data quality and ultimately it will be associated with adverse events occurrence in the patient.

Nursing processing forms are one of the important forms in the health care system. Out of the 47 admitted patient in the three hospitals, only 13(27.65%) of forms are found. Among those only 2(4.25%) of them were completely recorded, others 11 was either empty or missed. Attributes like date, sign weight, age temperature, and respiration were missed. And some others were used

other format or rough paper unstandardized format. The rest 34 of the patient records were not found which all are supposed to have the nursing processing forms.

This implies the practices of the nurses are very poor and what makes worst is the nurses are the one who spend much of their time with those seriously sick and admitted patient but they lack one of communication tools about the patient “data”. Even if the procedures were done it will be difficult to communicate among the care givers what is going on with the patient. This may result different complication to the patient and also might impair the health care service tremendously. This shows the severity of the problem and its magnitude vividly.

Perceived challenges and solution of quality patient medical record in the hospitals were reported as ,52.5% of respondents’ mentioned work load as a main challenge, followed by 42.9% Lack of Knowledge of health workers about importance of patient medical record. And as solution to solve the problem given by respondents’ were 56.8% of them mentioned that increasing leadership quality of the hospital administration followed by 41.9% automating the health management information system were major opinions to alleviate the problem.

Similarly other related researches support the given result by addressing the issues of patient record problem. The researches by Tegegn states that the gaps in the current HMIS were linked to lack of training, inactive supervision, staff workload pressure and the lengthy and laborious nature of the system. And the research concludes a state of poor health data collection, lack of informed decision-making at the facility level and the factors for change in the country's HMIS are needed. Tegegne’s research also suggests need for new innovations including incorporation of HMIS in the ongoing reviews of the curricula for all cadres of health care providers (Tegegn Kifele , 2010).

Only sex and education level from demographic variables have shown statistically significant association with both bivarate and multivariate logistic regression.

In relation to gender and practices on patient record registration process. Males’ participants have 1.83 times good practice than females. The result from multiple logistic regression (Table.12) indicates that males have P-value= 0.009, Exp(B)= 1.832 with upper and lower 95% C.I. for EXP(B) (1.160,2.893). Unfortunately males have shown better performance on patient record registration processes even though women’s were believed to be more responsible than males.

From similar study from Ethiopia by Tegene in 2010 all the socio-demographic variables but only marital status from those, being unmarried was found statistically significant [COR =3.22(95% CI =1.80, 5.75)] and [AOR =2.67(95%CI=1.28, 5.59)].

The attitude as independent variable and the total practice as independent variable computed with chi-square test and the result show no significant association was found, another confirmatory test were done by using bivarate logistic regression on total attitude with total practices the result shows that no statistical significant association were found. Again the attitude was computed with multivariate logistic regression as independent variable with the total practices as dependent variables has no statistical significant association.

Similarly the study done by Hasan from Iran on 2008 reported the relationship between attitude and practice using of β Kendall's Tau Test was 0.003 and p value = 0. 967 this is no statistically significant association (Siamian,2008). Even though, Iran is not low income country and the situation quiet different with Ethiopia as low income country the result explain in favor of this result. This might be due to the broad scope of attitude and may be the most determinant elements might not be sufficiently include in the tools used.

The knowledge of the clinical health workers knowledge level were categorized based on mean value as good and poor knowledge level. These categorized knowledge levels were computed with bivariate and multivariate logistic regressions computation have sown statistical significant association with the practices of patient record registration processes. Especially the result found from multivariate logistic regression indicates participant who have good knowledge have 2.3 times good practice than participants who do not have good knowledge (Table.12).

Similarly, the study from Iran done by, Hasan on 2008, reports that the relationship between knowledge and practices, as β Kendall's Tau Test was used finding was 0.005 and p value = 0.038, which was statistically significant association. This implies knowledge on patient record registration processes will help the good patient record registration processes positively(Siamian,2008).

Educational levels of the participants have shown statistical significant association both with bivarate and multivariate logistic regression. This makes educational level is another factor that

affects the practices of patient record registration processes. Among educational levels statistical significant association were found for health officers, diploma nurses and B.Sc. nurses only as compared to specialists (Table.12). From multivariate logistic regression the health officers show 10.3 time good practices on patient record registration processes than specialists. The diploma nurses have 3.6 times good practices on patient record registration processes than the specialists. And also the B.Sc. nurses have shown 3.32 times good practices on patient record registration process than the specialists.

In contrast research done by Tegene on 2010 reported that 'among the professional categories degree hold [COR=2.93(95%IC=1.37, 6.24)] and (AOR=2.93(95%CI=1.06, 8.11)] the report had explained that degree holders had better practices almost three fold than diploma holders . The same study concludes that the delinquencies of medical records at these university-affiliated hospitals also are due to lack of awareness of the students towards the method of medical records documentation.

In addition, lack of desire in completion of records can affect quality of their practice(Tegegn Kifle, 2010). This result might be due to the knowledge level of CHWs on patient record registration processes.

According to the research result from Ethiopia by Elizabeth on 2007, the result shows medical record accessibility and completeness and physician satisfaction improved statistically significantly (P, 0.05) based on pre- and post-intervention comparisons. The success rate of retrieving the proper medical record number for returning patients improved from 14% to 87% (P, 0.01) (Elizabeth, Wong , 2013).

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6. Strengths and Limitations of the study

6.1. Strengths of the study

The research is the first of in its kind especially on practice of patient record registration process. In addition this research has used mixed methods such as quantitative, qualitative to assess factors that affect the practices of patient record registration processes. Moreover patient record review was made to assess the data (patient record) quality levels in the selected hospitals.

6.2. Limitations of the study

There was shortage of local data on the subject is limited as there were no other studies that could be cited. The record reviews were only 166 patient records reviewed because of high expense it requests and this might have impact on the study. There was shortage of standardized questionnaire, on data quality, knowledge, and practices of patient record registration process.

7. Conclusions and Recommendations

7.1. Conclusions

The study revealed that knowledge of the CHWs regarding the implementation guideline in relation to patient record registration process is poor.

The attitudes of CHWs in relation to patient record registration processes have no statistical significant association with total practices. However; significant numbers of CHWs have shown poor attitude towards patient record registration processes.

The CHWs have poor practices on implementing the Ethiopian Hospitals Reform Implementation Guideline and also much of the CHWs lack the basic knowledge on the content of the Guideline about patient record registration processes.

The factors that affect the practices of patient record registration processes are sex of CHWs, education level, and knowledge of clinical health workers on patient record registration processes were identified as factors.

The practices of the CÈWs with their education level, Health officer have good practice on patient record registration processes than other CHWs. And the second best practices were recorded by diploma nurses. Specialist's, general practitioners and dentists are among poor achievers on patient record registration practices.

The feedback and supervision from AAHB to the CHWs about the data quality and about the importance of the data they produced were weak. The data quality problem is multifaceted especially the nursing processing forms were very much hampered in data quality problems. And also the act of taking responsibility about the patient record they produced was very weak. Especially most of the patient records were incomplete, the error correction styles were very poor or not as the guideline orders them to do so, card loss and un-standardized format usage have impaired the data quality.

Lack of sufficient attention from the politician and deficiency of budget are among some of the factors that affects the practices of data quality in the public hospitals.

7.2. Recommendations

The hospital administrator or A.A.H.B or NGOs should provide refreshment training to most of the CHWs on Ethiopian Hospital Reform Implementation Guideline. Especially providing it for specialists, dentist and B.Sc. nurses will reduce the problem significantly.

In order to increase the practices of CHWs on patient record registration processes especially those with high education level providing performance based motivation/ incentives may help in boosting the practices of patient record registration. This could be done by implementing transparent monitoring and evaluation strategies so that all should use standardized format to record medical records. The motivation might be giving recognitions by higher officials and the hospital community or providing money as a reward for best achievers of the month.

The nursing processing forms need special attention by all stakeholders like head nurses, hospital administrators and the nurses themselves. The nurse to patient ration should be taken in to consideration. Increasing number of nurses and implementing three shift systems might reduce the workload of the nurses.

The hospital should designee system by which new comer's CHWs take orientation about patient records quality and how to do patient record registration process before they start the job. And the way they can learn from other staffs that had knowledge, such as visit to best preformed hospitals, discussion forums on issues might help to increases the practice on nursing processing forms.

Patient record department workers should be recruited based on the knowledge needed or education level needed for the job. And they should have significant or attractive development structure regarding salary scale to reduce the turnover in patient medical record departments.

Females have sown poor patient record registration processes therefore more training should be provided for female clinical health workers.

The Addis Ababa Health bureau should give sufficient attention for patient record quality and should allocate sufficient budget for the logistics needed. And also capacity building or training might be helpful for the hospital administrators so that they efficiently deliver the necessary logistics at the right time.

The AAHB should create direct communication system with the CHWs at the hospital level to give feedback on their performance on data quality (Patient Record quality) they produces.

N.G.O's should support the hospitals in capacity building on the identified problems on studied and on regular basses.

The hospitals need to have information technology department at hospital level and the health management information system needs to be automated in order to harvest the best out of the system.

The researcher may assess the Medco-legal issues in relation to patient record quality in the hospitals. The attitude of the health workers might be further studied with broad scope by considering from different prospective.

The health care system quality including and occurrences of adverse events in relation to patient record quality was less explored research area in the country.

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Annex I

ADDIS ABABA UNIVERSITY

SCHOOL OF PUBLIC HEALTH AND INFORMATICS

HEALTH INFORMATICS PROGRAM

Informed Consent

Today, I am here to take data from selected hospitals by using questionnaires which are prepared by Shimelis Shiferaw .You are selected to participate in this study.

The purpose of this questionnaire is to collect data from health workers who are working in the selected hospitals to assess the knowledge, attitude and practices of health workers towards manual medial patients' record registration in Addis Ababa. The result of this study will help improve the health care services and will also be used as an input. I would like to assure you that the information that you provide is strictly confidential and will be used only for the research purpose only. Your name and any form of personal identifiers will not be written on the questionnaire and you do not have to answer any question if you do not want to take part or you have the right to stop filling this questionnaire at any time and I will respect what so ever your decision will be. But the genuine information that you will provide is enormously useful to achieve the objective of this study.

Taking the information you got from the above into account, I would greatly appreciate your cooperation in responding to this questionnaire. The time that you need is about 20 minutes to fill it. Are you willing to participate in this study? 1. Yes 2. No

Thank you for your willingness to participate in this study!

Name of data collector_____ sign _____Date_____

Name of supervisor _____ sign _____ date _____

Annex II

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HEALTH INFORMATICS PROGRAM

Self- administered questionnaire for hospital health workers' to assess their knowledge, attitudes and practices towards manual patients' record registration in selected hospitals the case of Addis Ababa

Part I: Demographic and socio-economic characteristics. *Instruction: Please answer the following questions by putting √ mark on the box you chose.*		
1.	Age (on completed year)	_____
2.	Sex (you can Mark√)	M ☐ F ☐
3.	Marital status (Circle on the number of your choose)	1. Single ☐ 2. Married ☐ 3. Divorced ☐ 4. Widowed/widower ☐ 5. Separated ☐
4.	Experience on this job in completed year	_____
5.	Monthly salary (Circle on the number of your choose)	1. below 2000 ☐ 2.2001-3000 ☐ 3. 3001-4000 ☐ 4. Above 4000 ☐
6.	Education level? (Circle on the number of your choose)	1. Specialist ☐ 2. Medical doctor ☐ 3. Dentist. ☐ 4. B.S.C Nurse. ☐ 5. Diploma Nurse. ☐ 6. Health officers ☐

Part II Knowledge

Instruction: Make [√] mark on your answer for each questions listed from 1-18 ,

No	Question	Category
1.	Is there any guideline that the hospital follows to register patient medical records?	1.Yes ☐ 2.No ☐ 3.I do not know ☐
2.	Do quality patient medical recording helps in resource allocation and planning in hospital?	1.Yes ☐ 2.No ☐ 3.I do not know ☐
3.	Do quality patient medical recording helps in decision making?	1.Yes ☐ 2.No ☐ 3.I do not know ☐
4.	Do quality patient medical recording helps in any public health action?	1.Yes ☐ 2.No ☐ 3.I do not know ☐
5.	Do you think the data you collect fits for the purpose of the hospital?	1.Yes ☐ 2.No ☐ 3.I do not know ☐
6.	Do you think that legible hand writing is important to keep data quality?	1.Yes ☐ 2.No ☐ 3.I do not know ☐
7.	Which one is recommended for recording patient medical records?	1. Black ink pen ☐ 2. Blue ink pen ☐ 3. Pencil ☐ 4. Any permanent ink pen ☐
8.	What do you think about the importance of patient medical data quality in relation to continuity of care?	1. Very important ☐ 2. Important ☐ 3 .less Important ☐ 4 .Not Important ☐ 5.I do not now ☐
9.	How do you evaluate your knowledge about Patient medical record in relation to Ethiopian Hospital Reform Implementation Guidelines?	1.Very good ☐ 2.Good ☐ 3.Low ☐ 4 .Very low ☐
10	Do you think incomplete patient medical record registration is associated with any form of adverse event?	1. Yes ☐ 2. No ☐. I don't know ☐
11.	Patients have the right to handle their medical records without the assistance of health workers?	1. Yes ☐ 2. No ☐ 3.I do not know ☐
12.	Do you think that patient complaints should be written in the patient's own words?	1. Yes ☐ 2. No ☐ 3. It could be rephrased ☐ 4. I do not know ☐

13.	How do you evaluate your knowledge about the process of error correction on patient's medical record registration?	1. Very good ☐ 2.Good ☐ 3 .Low ☐ 4 .Very low ☐
14.	Do you think all important data of the patent will be recorded properly in this hospital?	1. Yes ☐ 2. No ☐ 3. I do not know ☐
15.	Could you evaluate your knowledge about data quality measurements (like completeness, security etc ?	1.Verygood ☐ 2.Good ☐ 3.Low ☐ 4.Very low ☐
16.	Have you ever heard of patient medical records security?	1.Yes ☐ 2. No ☐
17.	What do you think the main challenges to keep patients medical records quality in this hospital?	1.Lack of knowledge of health workers about importance of patient medical record ☐ 2. Lack of leadership quality of the leaders ☐ 3.Lack of supervision on performance ☐ 4. Work load of the each health workers ☐ 5.Lack of automation the system ☐ 6.If others please specify _____
18.	How do you think the challenges of quality patient medical record will be tackled in the future?	1. Giving on job training for health workers ☐ 2.Automating the health management information system ☐ 3.Motivating the health workers by increase salary ☐ 4.Increasing leadership quality of the hospital administration. ☐ 5. If others please specify _

Part III. Assessing Attitudes

Instruction: Please complete the following idea by putting √ mark on the box you have chosen to show your level of agreement on the issue.

No	Ideas	Strongly Agree [1]	Agree [2]	Indifferent [3]	Disagree [4]	Strongly Disagree [5]
1.	Recording all patient history is useful to the-patient treatment outcome.	☐	☐	☐	☐	☐
2.	Completeness of patient medical record is an important factor in reducing adverse events.	☐	☐	☐	☐	☐
3.	I perform patient medical record registration with interest.	☐	☐	☐	☐	☐
4.	Accurate and well-documented records are evidence of appropriate patient care.	☐	☐	☐	☐	☐
5.	Inaccurate, altered records may imply poor patient medical record process.	☐	☐	☐	☐	☐
6.	If a medical procedure is done, but not documented, it is considered not done.	☐	☐	☐	☐	☐
7.	Accurate and well-documented patient medical records help in health service planning activities.	☐	☐	☐	☐	☐

Part .IV Practice

Instruction: Write your answer on the space provided or circle the options under the question as your answer.

No	Question	Category
1.	How many numbers of patients do you serve per day in this hospital? (Write on the space provided)	1.Minimum_____,2.Maximum _____
2.	How much time on average do you spend in treating and writing the record of a single patient while giving treatment? (in minutes) ? would you write it	_____
3.	Do you collect feedback about your performance on patient medical record quality and validity?	1. Yes 2. No 3. I have no idea
4.	If your answer is yes for question #4, from whom do you get feedback?	1. Patients 2. Hospital Administrators 3. Addis Ababa Health Bureau 4. Ministry of Health 5. NGO's 6. Staff members 7.If others please specify___
5.	How often do you collect feedback on patient medical recording in any form?	1. Daily 2. Weekly 3. Monthly 4. Yearly 5. No regular time
6.	Have you ever discussed formally with the other health workers to evaluate the effectiveness of patient's medical recording processes in this hospital?	1. Yes 2. No
7.	If No for question #7, why? Write on the space provided.	_____
8.	Have you ever had on job training in any form on Patients medical record management?	1. Yes 2. No
9.	If No for question #10, Why? Write on the space provided.	_____
10.	Do you put your name, signature & your title on the space provided after you write data on patient medical records, for which you are responsible?	1. Yes 2. No
11.	If your answer for question #12 is No, why?	_____
12.	Do you protect the confidentiality of patient's medical records protected properly(only accessed on need to know bases)	1. Yes 2. No 3. I do not know

Thanks for your precious time and cooperation!!

Annex III

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Part: V ***The following is a check list to evaluate the practices and quality of the patient medical record in selected Hospitals in A.A. on sample drown Patient medical Records***

Hospital code: _____ Card No:-_____

1. Access time taken _____
2. Does the patient MR have PMRN on its place 1. Yes ☐ 2. No ☐
3. Does every form contain the name of the patients on its place? 1. Yes ☐ 2. No ☐
4. If no for question #4 which parte is missing list theme 1. Yes ☐ 2. No ☐
5. For which service the patient had visited? 1. 1. OPD 2. IPD
6. Which patient medical record temple is available?

A. Hospital summary sheet of all visit dates ☐ B. Hospital Discharge summary ☐

C. Demographic Sheet ☐ E. Hospital & physical examination Assessment ☐

F. Hospital progresses note ☐ G. Physician order sheet ☐

H. Medication Administration record ☐ I. IV Fluid Balance chart ☐

If others lis_____

7. Are all existing forms filled completely? 1. Yes ☐ 2. No ☐

Are all existing forms filled completely? 1. Yes ☐ 2. No ☐

8. If No for question#8 which form/s is/ are incomplete? List them which parts of the above listed forms have a incomplete information? _____
9. Is there any temples replaced by other sheet of paper or other forms? 1. Yes ☐ 2. No ☐
10. If yes for question # 11 which form?_____
11. Dose all five Nursing processing forms are available for admitted patient?

1. Yes ☐ 2. No ☐

12. If No for question #12 which forms is missing? _____

13. From the above mentioned (found) forms which part of the information are missing?

_____

14. Are they chronologically ordered and well documented? 1. Yes ☐ 2. No ☐

15. Is the hand writing legible enough for all clinical staffs? 1. Yes ☐ 2. No ☐

16. Do they write the date and signed on the space provided? 1. Yes ☐ 2. No ☐

17. Are the forms free from error? 1.Yes ☐ 2.No ☐

18. Do they follow the guide line to correct errors? 1.Yes ☐ 2.No ☐

19. Number of patient medical card loss from its place when searched by chance?

1. Yes ☐ 2.No ☐

Annex IV

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HEALTH INFORMATICS PROGRAM

In–depth interview guide for health workers in selected hospitals to assess their knowledge attitudes and practice .

Respondents: The respondents for this interview are the hospital administrators, health workers and heads of record offices in the selected hospitals.

Name of the hospital _____

Your position in the hospital _____

Date of interview _____

Introduction: Hello! I am Shimelis Shiferaw. I came from Addis Ababa University and I am a second year postgraduate student of Health Informatics. I am here today to interview heath care providers and hospital administrators to assess their knowledge, attitude and practices towards manual patient record registration. Both positive and constructive comments are well come. You would say any points concerning your knowledge, attitude, and current practices about patients' medical records in the hospitals where you work. With your permission, I will use tape recorder to ensure accuracy of the data collection. I would like to confirm that all your comments are confidential and will be used for research purpose only. This interview will be conducted only if you agree to take part in this study.

Are you willing to participate in the study? If you are willing to take part in this study, I will continue the interview.

Thank you for your willingness!

Annex V

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HEALTH INFORMATICS PROGRAM

Question for Interview

Part I. *The following are structured questionnaire for in-depth interview with* Addis Ababa Health bureau focal person to *assess factors that affects the practices of patient medical recording in the hospital.*

1. How do you evaluate the data quality at Patient medical records registration processes in the hospitals administered by AAHB?
2. Do you give feedback to the clinical health workers (Medical doctors, Health officers, Nurses etc) about the data quality and the importance of the data they collect?
3. Did the Addis Ababa health bureau ever arranged on job training on the patient medical records for clinical health workers? If yes how often?
4. What do you think the challenges that hinder you from improving the PR quality at these hospitals?
5. What are the solutions you suggest to solve the problems?

I would like to thank you once again for your cooperation and spending your precious time with me!

DECLARATION

This thesis is my original work. It has not been presented for a degree in any other university and all sources of material used for the thesis have been duly acknowledged.

_____

SHIMELIS SHIFERAW DENEKE

The thesis has been submitted for examination with my approval as university advisors

_____ _____

Mr. ERMIAS ABEBE (M.Sc.) **Dr. AYELE BELACHEW (MD)**

February 2014

Addis Ababa/ Ethiopia