ACCURACY AND COMPLETENESS OF MEDICATION HISTORIES IN PATIENTS IN MEDICAL ADMISSION WARD AT UNIVERSITY TEACHING HOSPITAL

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2015

DECLARATION

I**, MELODY MUTINTA** hereby declare that the work on which this discussion is based is original, except were acknowledgement indicate otherwise.

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CERTIFICATE OF APPROVAL

This dissertation of MELODY MUTINTA has been approved as partial fulfilment of the requirements for the award of the Degree of Masters of Clinical Pharmacy by the University of Zambia

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DEDICATION

To my children Bertha and Morris Jr and everyone else who baby-sat for me so that I could bring this work to reality. Thanks to my husband Morris Mbewe and my little ones Luyando and Tendai for their time and for urging me on. And thank you God for giving me good health, guidance and above all wisdom.

ABSTRACT

Quality documentation of medication histories at the time of hospital admission with regard to accuracy and completeness is not documented at UTH. A medication history is a detailed, accurate and complete account of all prescribed and non-prescribed medications that a patient had taken or is currently taking prior to a newly established or ambulatory care.

This clinical research was guided by the question of how accurate and complete ~~are~~ medication histories are at the time of hospital admission. The aims were to determine the accuracy and completeness of documentation of medication histories in clinical records at the time of hospital admission.

A cross-sectional study that involved interviewing patients and reviewing their clinical records at medical admission ward, UTH, was conducted over a period of 3 months. The study enrolled 322 patients admitted to this ward who were above 18 years of age and were able to communicate verbally, if not, were accompanied by a caregiver. Clinical records of these patients were screened to review all medications the patient was taking and patients/caregivers were interviewed to obtain a complete medication history. An interviewer administered questionnaire was used to collect data according to specific objectives. All information obtained through interviews was compared with medications recorded in the patient's clinical records at the time of admission to the hospital. The Statistical Package for Social Sciences (SPSS) version 22 was used for all statistical calculations. Categorical data were expressed as frequency and percentage and presented using tables. The association between accuracy of medication histories and completeness of documentation was assessed using Pearson chi-square test, $p<0.05$ was considered statistically significant. Ethical approval was obtained from the ERES CONVERGE IRB Biomedical Research Ethics Committee.

Of 287 clinical records, 175 (61%) incidents of inaccurate medication histories at the time of admission were identified and that medication histories in clinical records of patients were incomplete or poorly documented.

This study shows that 61% of medication histories in patients at the time of admission to hospitals are inaccurate. Quality documentation of medication histories in clinical records at the time of hospital admission is poor.

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ACRONYMS AND ABREVIATIONS

ADR	Adverse Drug Reaction
CAM	Complimentary and/or Alternative Medicine
CD	Controlled Drug
CR	Controlled Release
ED	Emergency Doctor
ENT	Ear, Nose, and Throat
GP	General Practitioner
HMR	Health Medical Records
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
OTC	Over-the-counter
POM	Prescription Only Medication
UTH	University Teaching Hospital
XL	Extended Release
SPSS	Statistical Package for Social Science (SPSS) software

OPERATIONAL DEFINATIONS

1. **Accuracy of medication histories -** A complete matching of medication name, dose, route and frequency of the two lists i.e. one obtained by the admitting physician and that obtained after admission through interviews and/or other sources by another clinician e.g. pharmacist (Gleason *et al.,* 2012).
2. **Complete medication history** - encompasses all currently and recently prescribed medications (including vaccines, diagnostic and contrast agents, radioactive medications, parenteral nutrition, blood derivatives, and intravenous solutions), samples from your doctor, and any medications you buy without a prescription, including over-the-counter medications, vitamins, and herbal supplements (JCAHO, 2005; Gleason *et al.,* 2012).
3. **Medication** - Any prescription medications, sample medications, herbal remedies, vitamins, nutraceuticals, vaccines, or over-the-counter drugs; diagnostic and contrast agents used on or administered to persons to diagnose, treat, or prevent disease or other abnormal conditions; radioactive medications, respiratory therapy treatments, parenteral nutrition, blood derivatives, and intravenous solutions (plain, with electrolytes and/or drugs); and any product designated by the Food and Drug Administration (FDA) as a drug. This definition of medication does not include enteral nutrition solutions (which are considered food products), oxygen, and other medical gases (*2010 Hospital Accreditation Standards*, The Joint Commission, 2010, p. GL19.)
4. **Medication discrepancy** - any aspect of medication prescribing not recorded by the admitting physician but is recorded in the pharmacy researcher-acquired medication history (Adopted from Daniel *et al (2010)*)
5. **Medication omission** – not ordering a medication used by a patient before admission.
6. **Medication reconciliation** - a formal process for creating the most complete and accurate list possible of a patient's current medications and comparing the list to those in the patient record or medication orders.

CHAPTER ONE

1.0 Background

Medication-related hospital admissions accounts for 2–4% of all admissions with higher rates (above 30%) in the elderly above 75 years, for unintended admissions, most of which are preventable (Runciman *et al*., 2003). A medication history is a detailed accurate and complete account of all currently and recently prescribed and non-prescribed medications that a patient had taken prior to a newly established or ambulatory care. Globally, inaccurate and incomplete medication histories at admission to hospital do exist with a high rate of errors (Tam *et al*., 2005) which can considerably harm patients (FitzGerald, 2009). Studies done in North America, Europe, Australia and Asia to describe the extent of inaccurate medication histories at the time of admission to hospital showed that up to 67% of patients under study had at least one medication history error (Tam *et al*., 2005). Abu -Yassin and Colleagues (2011) report that there is a relatively scanty published literature existing on this subject in Africa.

Barnsteiner (2008) foresaw the need for a study on all parts of the medication reconciliation process to provide an evidence base for addressing adverse drug events. A recent study shows that in Saudi Arabia, inaccurate medication histories at the time of hospital admission are common; however, the results might be considerably different in other developing countries as studies of this nature are lacking (Abu-Yassin *et al*., 2011). Cornish *et al.* (2005) believe that better methods to ensure accurate admission medication histories are needed to improve patient care and minimise adverse drug events. Greenwald *et al*. (2010) supports the need for studies to assess the potential solutions to overcome these and other common barriers.

A study done at a tertiary care teaching hospital by Cornish and Colleagues in Canada in 2003 on patients admitted to the general internal medicine units with 151 eligible patients showed that 54% had medication history errors. From these, 39% had the potential to cause moderate to severe discomfort or clinical deterioration (Cornish *et al*., 2005). Unroe *et al.* (2005) upon examining 205 patient records of a

tertiary care academic teaching hospital in Durham, North Carolina in 2005 found that while 178 patients had medications listed, 23% of these had one or more discrepancy identified on admission; 19% of these were considered to be potentially harmful. In a study carried out in 2009 at a 1200 bed tertiary hospital in Riyadh, Saudi Arabia, by Abu-Yassin *et al*., (2011), 37% of patients were found to have at least one discrepancy in their admission medication histories, with the most common being omissions of medications (35%) and dosage errors (35%)). In Nigeria, a low level of medication history documentation was reported in patients prior to admission (Yusuff and Awotunde, 2005).

This study intended to assess the accuracy and completeness of medication histories obtained in patients upon hospital admission. An accurate and comprehensive medication history taking approach that included an interview, inspection of medication containers or lists, or both, documenting the patient's medication history was used, and this was compared with medications recorded in the patient's clinical records (i.e. medical notes and drug chart) at the time of admission to the hospital.

1.1 Statement of the problem

Quality documentation of medication histories at the time of hospital admission with regard to accuracy and completeness is not documented at University Teaching Hospital (UTH). Similarly, Cockayne *et al.* (2005) reports that clinicians hardly record complementary and alternative medicines (CAM) use in patients' health medical records.

Although a gold standard for obtaining consistent medication histories from patients is lacking, (Cornish *et al*., 2005; Yusuff and Awotunde, 2005) clinicians should at least get as much needed information as possible by spending some time with the patient interviewing him/her regarding all currently and recently prescribed drugs, over-the-counter (OTCs), CAM, social medicines (illicit drugs, alcohol, cigarettes), previous ADRs including hypersensitivity reactions, allergies and adherence to therapy so as to have a good medication history. This will improve accuracy and comprehensive medication history taking despite it being an overwhelming task for busy admitting physicians.

An inaccurate and incomplete medication history may adversely affect patient care. It may lead to interrupted (or inappropriate) drug therapy during hospitalization (Cornish *et al.,* 2005; Tam *et al.,* 2005; Perennes *et al.,* 2012). It can also lead in failure to detect drug-related problems (underlying pathology) as the cause of hospital admission (Cornish *et al.,* 2005; Yusuff and Awotunde, 2005; FitzGerald, 2009; Dersch-Mills *et al*., 2011) which in turn increase mortality, morbidity, and health care costs (Abu-Yassin *et al*., 2009)

This study endeavored to assess the accuracy and completeness of medication history obtained from patients at the time of admission to hospital. The study will add on to the body of knowledge and will be of benefit to the clinicians, patients and the policy makers.

1.2 Research question

How accurate and complete are medication histories at the time of hospital admission at UTH?

1.3 Significance of study

Studies show incomplete and inaccurate medication histories at the time of hospital admission as a common and worldwide problem (FitzGerald, 2009). The process of documenting and communicating medication information to various clinicians at transition points is not straightforward (Cockayne *et al.,* 2005; Barnsteiner, 2008).
Therefore, this study would provide baseline data for studies on drug related admissions as there was no published data in Zambia at the time of review. It would help to improve on communication of medication information across the continuum of care i.e. referral system thus improve patient care and minimize the potential costs of preventable adverse drug events. The results would help to influence clinical practice e.g. standard of practice (SOPs) on drug history taking hence, benefiting the healthcare team, the patients, and the policy makers.

1.4 General objective

The general objective was to assess the accuracy and completeness of medication histories obtained in patients upon hospital admission.

1.5 Specific objectives

Specifically, the objectives of this study were:

1.5.1 To determine the accuracy of medication histories at the time of hospital admission.

1.5.2 To determine the completeness of documentation of medication histories in clinical records at the time of admission.

1.5.3 To determine the association between accuracy of medication histories and completeness of documentation of medication histories in clinical records at the time of admission.

CHAPTER TWO

2.0 LITERATURE REVIEW

This section provide an understanding of accuracy and comprehensive medication history obtained in patients at the time of admission to hospital and will be reviewed under the following headings:

2.1. Introduction

2.2. Accuracy of medication histories

2.3. Completeness of medication history documentation

2.4. A review summary

2.1. Introduction

An accurate and complete medication history taken at the time of admission to hospital determines the nature of therapeutic decisions to be made during a patients hospital stay. The patient's medicines may be continued, temporarily held or permanently withdrawn after an evaluation of the drug history (Unroe *et al*., 2010; Hellström *et al*., 2012). Medication history errors frequently occur at admission and tend to be significant clinically (Vira *et al*., 2006). Methods to reduce the incidence of these errors include training of admitting physicians, having access to community pharmacy records and improving communication between physicians, pharmacists and patients (Tam *et al*., 2005; FitzGerald, 2009).

2.2. Accuracy of medication histories

A medication history is said to be accurate if there is a complete matching of medication name, dose, route and frequency of the two lists i.e. one obtained by the physician upon hospital admission and that obtained after admission through interviews and/or other sources by another clinician such as a pharmacist (Gleason *et al.*, 2012). The medication list should have the full name of each medicine (including any letters that may appear after the name such as XL, CR, CD, etc.); strength of each medicine (mg, mcg, units, etc.); dosage i.e. how much you take for each dose (1 tablet, 2 puffs, etc.); route of administration i.e. how you take it (by mouth, inhaler,

injection, etc.); frequency i.e. when you take it (in the morning and evening, once a week, etc.) and; the date and time of your last dose (Gleason *et al.*, 2012).

Crook *et al*. (2007) conducted a study over six weeks, May 2005-July 2005, in Australia at Royal Adelaide Teaching Hospital with 604 beds to examine the accuracy of medication history taking in the Emergency Department (ED). A convenience sample size of 100 patients aged ≥ 70 years on ≥5 regular medications, with ≥3 comorbidities and / or had been discharged from hospital 3 months prior to the study were recruited and data for these patients were reviewed. From a total of 1152 drugs recorded, 966 discrepancies were observed; 90% of these were omitted medications, dose and frequency. The findings were that none of the original medication history by the ED doctor was complete. The most accurately recorded drug groups were cardiovascular, electrolytes, coagulation/blood formation and endocrine medications as they were regarded to be most important by the physicians, whilst dermatological, ear, nose and throat (ENT) drugs, allergy, CAM and analgesics were poorly recorded. The results suggest that documentation of patients' adverse drug reaction (ADR) history is currently poor as 48% of the patients ADR were not recorded by the ED doctors. These findings are comparable to those of Yusuf and Awotunde, (2005) that presented similar results of low level of documentation existing on CAM, allergy and OTC drug use.

Miller *et al*. (2008) undertook a prospective enrolment study to determine the accuracy of medication histories acquired on trauma patients by initial health care providers compared to a medication reconciliation process by a clinical pharmacist after the patient's admission and whether trauma-associated factors affected medication accuracy. A sample size of 234 trauma patients admitted to a Level I trauma centre (Conemaugh Memorial Medical Centre), Johnstown, Pennsylvania, was considered. The study showed that medication lists by the Admitting trauma team were inaccurate in 96% cases as errors were found by the clinical pharmacist in medication name, strength, route, and frequency.

In 2012, Hellström and Colleagues reported that 47% of 670 study patients experienced at least one medication history error at admission. This was in a study to describe the frequency, type and predictors of errors in medication history, and to assess the extent to which standard care corrects these errors. The study was

performed in two internal medicine wards (designated A and B) at the University hospital of Lund, Sweden, using Lund Integrated Medicines Management (LIMM)-based medication reconciliation. Medication reconciliation was carried out soon after each patient was admitted by the clinical pharmacist to identify the patient's most accurate medication list before admission and this was compared with the medication list of the same patient in the HMR. An error in this case was defined as either an addition or withdrawal of a drug or changes to the dose or dosage form in the hospital medication list whereas a medication history error was that for which no clinical reason could be identified (Hellström *et al*., 2012). A systematic approach for individualising and optimising inpatients drug treatment can be of benefit in reducing errors in medication histories. The use of pharmacy databases (e.g. LIMM) alone is insufficient for obtaining an accurate and complete drug history from the patient. There can be inconsistences in data entry by the clerks such as not uploading all medication data or they can be limited by system interruptions e.g. interruption of electricity. Therefore, it is essential to link patients' health information, including prescribed medications, from various health care systems (Kalb *et al*., 2009; Abu-Yassin *et al*., 2011).

In a study in Riyadh, Saudi Arabia, in 2009, by Abu-Yassin *et al*. (2011) to investigate the role of pharmacists in identifying discrepancies in medication histories at admission; Pharmacist interviewed patients in the medical, emergency, and cardiology wards to determine all medications used pre-admission to hospital. Of the 60 patients studied 37% were found to have errors in their medication histories, the majority of these involved errors of omission (35%) or dosing errors. Patients' interview prior to hospital admission is necessary in acquiring accurate medication histories. Abu-Yassin and Colleagues' stance is that statistics are absent concerning the magnitude of this patient safety issue in most developing countries. It shows how the findings of this study may contribute to the body of knowledge on this subject.

A study undertaken in the UK supports other earlier studies that significant statistics of errors amongst documented sources of patients' medicines and what patients report they are taking do exist. One hundred and twenty-six medical patients and 51 surgical patients were reviewed and interviewed by the pharmacist to obtain a medication history, and this was later compared with the physician's history as

recorded in the medical notes. This was in a study to ‘determine and evaluate the accuracy of physician-acquired medication histories for patients admitted to the surgical and medical admission units in a large teaching hospital.’ It was found that 102 medicines were prescribed on the inpatient chart but not recorded in the medical notes; 179 medicines were recorded in the notes but not prescribed on the chart; and 75 medicines documented in the notes had no dose. Medicines identified through pharmacist interview included: 227 not on the chart; 189 not in the notes; 113 had a dose different from that in the notes; 45 had a dose different from that on the chart; and 103 had a dose different from that in the third source and 51 were neither on the records of the general practitioner (GP) nor nursing home (Collins *et al*., 2004). This contributes to existing body of knowledge by emphasizing that a perfect and more complete documentation of medication histories in the patient's medical records is required (Cornish *et al*., 2005). The inaccuracies detected with GPs' records in comparison with hospital records also adds to the knowledge that there is no ‘gold standard’ medication history available at the moment, other than relying on taking patients drug list (Cornish *et al*., 2005; Yusuff and Awotunde, 2005).

2.3. Completeness of medication history documentation

A complete medication history encompasses all currently and recently prescribed medications (including vaccines, diagnostic and contrast agents, radioactive medications, parenteral nutrition, blood derivatives, and intravenous solutions), samples from your doctor, and any medications you buy without a prescription, including over-the-counter medications, vitamins, and herbal supplements (JCAHO, 2005; Gleason *et al.,* 2012).

Re`onja *et al*. (2010) reported a high rate of discrepancies (72%) in medication history at the time of admission and a high level of incomplete information on drug use in the medical record. This was in a study to assess the benefits of a comprehensive medication history against a medication history taken by the admitting GPs in Slovenia in 2008. In 108 patients randomly selected for inclusion in the study, thorough information on drug name, dose, frequency and route of administration were acquired for 94.9 % of medicines. Most data was provided directly by the patients. However, patients who were admitted because of allergy were excluded from their study. Information on allergic reactions is one of the

aspects that constitute complete medication history thus should have been considered. Most allergic reactions are attributed to drug use and may cause hospital admissions in many instances (Cornish *et al.*, 2005; Yusuff and Awotunde, 2005; FitzGerald, 2009; Dersch-Mills *et al*., 2011). This study addressed nearly all the components of a complete medication history.

A retrospective cohort study of 205 adult patients was carried out at Duke University Medical Centre, a tertiary care academic teaching hospital, Durham, North Carolina from 1st July to 31st August 2005. The aim was to describe the incidence, drug classes, and probable importance of hospital admission medication discrepancies and discharge regimen differences. A chart review was done to collect the necessary data required. The results indicate that 27 of 205 patients did not have their medication recorded on admission. Of the 178 patients whose medications were listed, 23% had $\geq$ 1 discrepancy identified on admission; 19% of these were considered to be potentially harmful. Unroe and Colleagues concludes that medication discrepancies on admission are prevalent for adult patients admitted to this academic medical centre (Unroe *et al*., 2010). However, the picture may differ if young patients are included in the study as age could be a confounder.

In Canada, Cornish and Others in 2003 conducted a 3-month prospective cross-sectional study on 151 patients admitted to the general internal medicine clinical teaching units (University of Toronto) whose primary objective was to describe the extent of unintended discrepancies (errors) between the physicians' admission medication orders and a complete medication history obtained through interviews. They found 81 out of 151 patients to have at least 1 unintended discrepancy prior to hospital admission. Of the 81 patients, 140 unintended discrepancies were identified; 46% involved the omission of a regular medicine that the patient was on before admission. These differences mostly were to do with drug omission or addition, substitution of an agent within the same pharmacologic class, and change in dose, frequency, or route of administration. This study proposed that the procedures for recording medication histories at the time of admission to hospital were inadequate, possibly unsafe, and in need of improvement (Cornish *et al*., 2005).

In Ibadan, Nigeria, at a 900-bed tertiary care facility, a three-month cross-sectional retrospective pilot study was carried out on 450 case notes of patients to evaluate the

completeness of drug history records. The results of this study revealed a low level of records of past use of POM, OTC and herbal drugs 33%, 12.9% and 6.9% respectively; dose, frequency and duration of use in only 6.4%, 6.4% and 8.4% of patients, while side effects experienced, prior to admission, was in only 1.6%; Allergies to drugs, food and chemicals were in 1.4%, 1.8% and 0.8% respectively; in addition, history of social drug use (alcohol, cigarette and illicit drugs) were done in 36.6%, 23.2% and 4.2% respectively; while patients' adherence history was noted in 10.2% of study sample. The conclusion made was that documentation of patients' drug history was not as detailed as it should be (Yusuff and Awotunde, 2005). Cockayne and Colleagues (2005) supports Yusuff and Awotunde on the low levels of CAM documentation in the medical record.

2.4. A review summary

Various methods and study designs have been used in evaluating medication history documentation. Unroe *et al.* (2010) and Cornu *et al.* (2012) opted for a retrospective cohort which had no control of what type of data was available as they were dependent on the quality of charting, no active follow up was done hence the outcomes seem not to be accurate. Yusuff and Awotunde (2005) carried out a cross-sectional retrospective pilot study whereas Cornish *et al.* (2005) performed a prospective cross-sectional study. This type of design gives a 'snap shot of the situation. Though patients may be enrolled over the course of months, the data for each patient is collected, recorded and analysed at one time. The advantages with this type of study are that it is cheaper and the information can be collected as quickly as possible because it does not require follow-up, however, it is prone to bias. Miller and Colleagues, (2008) chose a prospective enrolment design meaning, they did not register the study participants at the same time. This can be time consuming and is also prone to some biases. Other scholars picked on prospective observation studies (e.g. Abu-Yassin *et al.*, 2011; Hellström *et al.*, 2012) but did not mention the study type. Therefore, this study used a prospective cross-sectional study design considering its objective, resources and the time frame involved. A systematic random sampling method was used to overcome bias.

CHAPTER THREE

3.0 METHODOLOGY

This chapter will look at the study design that was employed; where the study was conducted; the study population; the actual sample size dealt with; sampling techniques; types of variables involved; data collection instruments and procedures; and how the data was analysed and presented respectively. The main objective of the study was to assess the accuracy and completeness of medication histories obtained in patients upon hospital admission.

3.1 Study design

Based on objectives one and two; availability of resources and the limited time frame involved, a cross-sectional study design was undertaken. A cross section study is one in which exposure and outcome are determined at the same time (Koepsell and Weiss, 2003).

3.2 Study setting

The study was conducted at the University Teaching Hospital, Medical Admission Ward Lusaka.

3.3 Study population

The study involved interviewing patients/carers and reviewing clinical records of patients admitted to medical admission ward meeting the inclusion criteria of the study. A study population of 2520 was considered after review of admission records. On average, 30 patients are admitted per day (Admission records, 2014), considering that data would be collected in 3 months, this average was multiplied with the number of days involved, i.e. 30(patients per day) x 7 (days in a week) x 4 (weeks in a month) x 3(months).

3.4 Sample size determination

A sample size of 334 patients was calculated using Open source epidemiologic statistics for public health at 95% confidence interval with a population size of 2520 and a prevalence of 50% +/- 5 (OpenEpi. version 2.3.1 Dec 2003).

3.5 Sampling techniques

A systematic random sampling method with a sampling interval of 8 (2520/334 =7.54) was used. This sampling method was chosen to overcome bias as it gives the assurance that the population will be evenly sampled and because of its simplicity.

3.5.1 Inclusion criteria

The following population was included in the study;-

- Age 18 years or older
- Admitted to the Medical admission ward
- Able to give consent
- Able to communicate verbally, if not, were accompanied by a caregiver.

3.5.2 Exclusion criteria

The following population was excluded from the study:-

- Age <18 years
- unable to give consent
- outpatients
- patients in isolation rooms

3.6 Variables

Table 1: Variables with their associated definitions and Study indicators

Specific objective	Variables for measurement	Type of variable	Study Indicators
To determine the accuracy medication history at the time of hospital admission	Accuracy of medication history	categorical	➢ medication name ➢ strength ➢ dosage ➢ route of administration ➢ frequency
To determine the completeness of documentation of medication use in hospital medical records at the time of admission.	Completeness of documentation	categorical	➢ Past use of POM ➢ OTCs ➢ CAM ➢ social medicines (illicit drugs, alcohol, cigarettes) ➢ previous adverse drug reactions ➢ allergies (food, drugs, chemicals) ➢ adherence to therapy ➢ Others (vaccines, etc.)

3.7 Data collection instruments

An interviewer administered questionnaire was used to guide the interviews and to note down the answers. Medication Safety Reconciliation Tool Kit developed by the North Carolina Centre for Hospital Quality and Patient Safety of September 2006 was adopted and this was modified to suit our setting. (Appendices A and B)

3.8 Data collection procedure

Patients were identified from Medical admission register. If eligible, interviews were conducted including examination of medication vials (if available) to obtain a complete medication history after consent. The interviews were conducted generally on the day

after the admission at the bedside of the patient. Patient's clinical records were screened to review all medications the patient was on prior to hospital admission. Data obtained from interviews was compared with that on the patient's clinical records. Data was collected over a period of three months.

3.9 Data analysis

A Statistical Package for Social Science (SPSS) software, version 22 was used to analyse data. For open-ended questions and clinical notes reviews, the questionnaires were scanned through to look for common responses. Numerical codes were given to such responses. When entering data for each response, the response was compared with those listed in the codebook and entered the appropriate number into the dataset. A codebook was drawn up and data was then entered into SPSS. For categorical variables, data was expressed as frequency and percentage. Data was presented using tables. The association between accuracy of medication histories and completeness of documentation was executed using Pearson chi-square (cross tabulation) test, $p < 0.05$ was considered statistically significant.

3.10 Ethical considerations

Permission was sought from the UTH Management to conduct the study at the institution. Ethical clearance was obtained from ERES CONVERGE IRB Ethics Committee. The Participants were required to sign a consent form. Measures were taken to ensure strict confidentiality through the assignment of a code number for each patient. Clinical records were handled within the hospital premises and in line with hospital regulations. Data will be kept in the computer until publication of the article under a lockable password only known by the researcher.

CHAPTER FOUR

4.0 RESULTS

This study was set to assess the accuracy and completeness of medication history taken in patients upon hospital admission. This section will present the characteristics of the study participants and the findings of the question posed in the introduction chapter in the following manner based on objectives one, two and three respectively.

4.1 Characteristics of the study participants
4.2 Determination of accuracy of medication histories at the time of hospital admission.
4.3 Determination of completeness of documentation of medication histories in clinical records at the time of admission.
4.4 Measurement of relationship between accuracy and completeness of documentation of medication histories in clinical records at the time of admission.

4.1 Characteristics of the study participants

Of the 322 patients that met the eligibility criteria, 154 (47.8%) were male, 27 (8.4%) were not on any medications prior to hospital admission and 25 (7.8%) patients did not have any medication histories in their clinical notes hence, accuracy of medication history was not determined in such. We interviewed 171 (53.1%) were patients and 151 (46.9%) were caregivers (Appendix H).

4.5 Determination of accuracy of medication histories at the time of hospital admission

In this study, out of 287 medication histories, 112 (39.1%) were accurate as no discrepancies were noted in medication name, dose, route and frequency of administration (Table 2). A number of discrepancies were identified during review of clinical records (Table 3). Some of the medications that the patients were on and prescriptions that were issued were identified through inspection of medication containers; these were not captured anywhere in clinical records (10.8%).

Table 2: Accuracy of medication histories at the time of hospital admission.

	Frequency	Per cent
Accuracy	112	39.07
Inaccuracy	175	60.97
Total	287	100

61% of medication histories were inaccurate as presented in the table 2 above.

Table 3: Types of discrepancies

Type of discrepancy	Frequency	Per cent
Medication Omissions	78	27.2
Dosage omission	34	11.8
Route omission	53	18.5
Frequency omission	34	11.8
Meds* on chart but not doc** in notes	14	4.9
Meds in notes but not doc on chart	6	2.1
Meds identified from interviews but not in clinical records	31	10.8
Wrong dose	8	2.8
Meds doc in notes with no dose, route and frequency	25	8.7
Others	24	8.4

Meds* = Medications, doc**= documented

Table 3 - shows the frequency of discrepancies in clinical records of 287 patients with drug omissions (27.2%) being the most common.

4.3 Determination of completeness of documentation of medication histories in clinical records at the time of admission

This study shows that medication histories in clinical records of patients in medical admission ward are poorly documented (Table 4)

Table 4: Completeness of documentation of medication histories

Component	Frequency	Per cent
Prescription only medications	177	55
Over-the -counter	40	12.4
Complementary and alternative medicines	24	7.5
Social history (alcohol, smoking, illicit drugs)	41	12.7
Adverse drug reactions	7	2.2
Allergies (food, drugs, chemicals)	6	1.9
Adherence	1	0.3
Others	2	0.6

Table 4 - shows Prescription only medications to be highly documented at 55%.

4.4 Measurement of relationship between accuracy and completeness of documentation of medication histories in clinical records at the time of admission.

The association between accuracy of medication histories and completeness of documentation was statistically significant ($p = 0.001$) as shown in Table 5.

Table 5: Association between accuracy of medication histories and completeness of documentation

	Value	df	standard deviation
Pearson chi-square	140.322a	6	0.001
Likelihood ratio	89.199	6	0.000
N of Valid cases	322		

CHAPTER FIVE

5.0 DISCUSSION

This chapter will discuss the findings of the study based on the specific objectives in review with literature as follows:

5.1 Determination of accuracy of medication histories at the time of hospital admission.

5.2 Determination of completeness of documentation of medication histories in clinical records at the time of admission.

5.3 Measurement of relationship between accuracy and completeness of documentation of medication histories in clinical records at the time of admission.

5.1 Determination of accuracy of medication histories at the time of hospital admission.

This study shows that medication histories in patients at the time of admission to hospital are inaccurate. Of the 287 medication histories examined, 61% were inaccurate. This is consistent with the findings of systematic review of 22 studies undertaken by Tam *et al*., (2005) which reported medication history inaccuracies to vary between 10 and 67%. The study carried out by Miller and Colleagues (2008) found a much higher percentage (96%) probably due to a longer medication reconciliation period (1-8 days) that was involved, unlike most studies (within 72 hours of admission).

This study found that at least one medication history discrepancy was present in 61% medication histories. The predominate discrepancy was medication omissions (27.2%) although it was lower than what other pooled data from other studies like Cornish *et al*., 2005 (46%) and Crook *et al*.,2007 (90%) showed. The results of this study have also shown discrepancies in dose omission, route, and frequency of administration at 11.8%, 18.5% and 11.8% respectively

The outcome of the clinical records review furthermore demonstrated that admitting physicians documented medications on drug charts and not in medical notes (4.9%)

and vice-versa (2.1%). This is in line with what Collins et al. (2004) found in their UK study. Medications were documented in medical notes without indicating the dosage, route and the frequency of administration (8.7%); however some of these were captured on the drug charts. We found physicians overlooking dose, route, and frequency of administration at 11.8%, 18.5% and 11.8% respectively in clinical notes corresponding to what was obtained in a study by Miller and Colleagues (2008).

In a similar study in Slovenia, Re`onja *et al*. (2010) reported more than one discrepancy per medication history similarly to this study, this was difficult to analyse (therefore, were grouped under others). Other discrepancies (8.4%) included wrong frequency of administration, wrong drug descriptions or names, incomplete dose, and differences between clinical notes.

5.2 Determination of completeness of documentation of medication histories in clinical records at the time of admission.

This study provides evidence that medication histories in clinical records at the time of hospital admission at UTH are incomplete. There was poor documentation of POM, OTC and CAM accounting for 55%, 12.4% and 7.5% of completeness respectively. Social history, ADRs and allergies were documented in 12.7%, 2.2% and 1.9% respectively. Adherence and other groups (such as samples, vaccines, and ENT were recorded in 0.3% and 0.6%. The results of our study are comparable with those of Yusuf and Awotunde (2004) although study designs were different. Equally, Re`onja *et al*. (2010) reported a high level of incomplete information on drug use in the medical record. A study that was conducted by Unroe *et al*., 2010 showed that 27 out of 205 patients did not have their medications recorded on admission, whereas in this study 25 out of 322 did not have medication histories in their clinical records.

5.3 Measurement of relationship between accuracy and completeness of documentation of medication histories in clinical records at the time of admission.

The depiction from the study shows that there was a statistically significant association between accuracy of medication histories and completeness of documentation ($p = 0.001$) as shown in Table 5. This means that medication history documentation has to be complete for it to be accurate.

CHAPTER SIX

6.0 CONCLUSIONS/RECOMMENDATIONS

6.1 Scope of the study and limitations.

UTH was chosen as the study setting because it is the biggest and the only tertiary hospital where most patients with complex diseases or disorders are referred to access specialist care. However, the following were the study limitations identified.

(a) Single study site. The study was conducted at a single centre (Medical admission ward), this makes it difficult to generalise the findings to other hospitals.

(b) Responder bias. The sample size that was calculated was 334. However, due to incomplete responses, only 96% patients were able to give full responses.

6.2 Conclusions

The findings of this study showed that medication histories in clinical records of patients at the time of admission to hospitals are generally inaccurate (61%) and incomplete. It can also be concluded that completeness of documentation of medication history has an effect on the accuracy of medication history ($p = 0.001$).

6.3 Recommendations

The following recommendations were made based on the findings of the study;

1. The use of a standardised form to be used by physicians on admission which should capture all the requirements of a complete medication history. This should be attached to the patients' file where the information will be accessible. (Appendix I)
2. Admitting physicians need to be sensitized about the importance of recording an accurate and complete medication history of the patients.
3. Clinical pharmacists should be engaged in documenting medication histories of patients on admission. This has been indicated by several studies that have been done in most developed countries (Carter *et al*., 2006; Reeder and Mutnick 2008; De Winter *et al*., 2010).
4. The study to be carried out at multi centres for the results to be generalised.
5. To know the association between the level of practice and drug history taking.

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APPENDICES

Appendix A: Researcher's Data Collection Form

APPROVED
- 8 NOV 2014
ERES CONVERGE
P/BAG 125, LUSAKA.

QUESTIONNAIRE

Title of the study:

Accuracy and completeness of medication histories in patients in medical admission ward at University Teaching Hospital

Questionnaire number……

Characteristics of study participants

1. Interviewed: Patient ( ) 1 Caregiver ( ) 2 Relationship……
2. Gender: Male ( ) 1 Female ( ) 2
3. Age of patient (in years since last birthday)

   18-25 ( ) 1 26-30 ( ) 2 31-35 ( ) 3 36-40 ( ) 4 41-45 ( ) 5

   46-50 ( ) 6 51-55 ( ) 7 56-60 ( ) 8 61-65 ( ) 9 Above 65 ( ) 10
4. Number of pre-admission medications.

   0 ( ) 1 1-3 ( ) 2 3-5 ( )3 5-7 ( ) 4 Above 7 ( ) 5

Prescription Medications

5. What prescription medications are you currently taking? ……

   Central Nervous System ( ) 1 Cardiovascular ( ) 2 Gastro intestinal ( ) 3

   Respiratory ( ) 4 ENT ( ) 5 Infection ( ) 6

   Hematologic (7) Oncologic ( ) 8 Hormone-modifying agents ( ) 8

   Dermatologic ( ) 9 Others ( ) 10 Specify……..
6. Why are you taking them? ……
7. How are you taking them?

   Oral ( ) 1 Puff ( ) 2 Patch ( ) 3

   Rectal ( ) 4 Injection ( ) 5 Application ( ) 6
8. When do you take them?

   In the morning ( ) 1 Twice a day ( ) 2 Three times a day ( ) 3

   At bedtime ( ) 4 Others …… ( ) 5
9. How many medicines are you currently taking?

   None ( ) 1 less than 5 ( ) 2 more than 5 ( ) 3
10. Are there any that you take only sometimes or when you need it?

Yes ( ) 1 No ( ) 2

11. If yes to question 6 above, what and how often do you take them? .....

12. Have you recently started any new medication?

Yes ( ) 1 No ( ) 2

13. Did you or your doctor change the dose or stop any of your medication recently?

Yes ( ) 1 No ( ) 2

OTC Medications

14. Do you take any medications that you buy without a doctor's prescription?

Yes ( ) 1 No ( ) 2

15. If yes, what is the name of the medication.....

16. Why do you take them? .....

17. How do you take them?

In the morning ( ) 1 Twice a day ( ) 2 Three times a day ( ) 3

At bedtime ( ) 4 When in need ( ) 5 Others .....( ) 6

CAM Medications

18. What herbal (natural) medicines or other supplements do you take? .....

19. Why do you take them? .....

20. How often do you take them?

In the morning ( ) 1 Twice a day ( ) 2 Three times a day ( ) 3

At bedtime ( ) 4 Others .....( ) 5

Social Medicine

21. Do you drink alcohol?

Yes ( ) 1 No ( ) 2

22. Are you a smoker?

Yes ( ) 1 No ( ) 2

23. Besides alcohol, do you take any medication on a regular or needed basis?

Yes ( ) 1 No ( ) 2

24. If the answer is yes to the above question, which one.....

25. Why do you take them? .....

ADRs.

26. Are any of the medications causing side effects?

    Yes ( ) 1 No ( ) 2

27. Have you changed the dose or stopped any medications due to side effects?

    Yes ( ) 1 No ( ) 2

Allergies

28. Do you have an allergy to any medication, food or chemical?

    Yes ( ) 1 No ( ) 2

29. What did you experience last time it was given to you? .....

30. How long did the reaction occur? .....

31. Have you received or tolerated the medication since then?

    Yes ( ) 1 No ( ) 2

Adherence to therapy

32. Are there any medications that you have stopped taking recently on your own?

    Yes ( ) 1 No ( ) 2

33. When did you stop taking them? .....

34. Why did you stop taking them?

    Felt better ( )1 Felt worse ( )2 Time ( ) 3

    Money ( ) 4 Others ( ) 5

35. Who assists you with your medications? .....

36. Have you taken anyone else's medications recently?

    Yes ( ) 1 No ( ) 2

37. Do you bring the medications with you to the doctor's office?

    Yes ( ) 1 No ( ) 2

Others (samples, vaccines, etc.)

38. Are you on any eye drops, inhalers, patches, medicated lotions or creams?

    Yes ( ) 1 No ( ) 2

39. Do you receive medicines from your doctor's office?

    Yes ( ) 1 No ( ) 2

Appendix B: Researcher's Data Collection Form

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MEDICATION HISTORY DOCUMENTATION FORM

Study Participants Characteristics	**Medication identification**	
Age……	POM ( ) 1	ADRs ( ) 5
Gender: Male/Female *(Tick)*	OTCs ( ) 2	Allergies ( ) 6
Interviewed: Patient/Caregiver *(Tick)*	CAM ( ) 3	Others ( ) 7
Number of pre-admission medications…….	Social Medicines ( ) 4	
	Tick if included on admission orders.	

Medication	Dose	Route	Frequency	Discrepancy		Discrepancy comments e.g. wrong dose
				Yes	No	

Appendix C: Clearance letter from the Assistant Dean Post graduate

THE UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

Telephone : +260211252641
Telegram: UNZA, Lusaka
Telex: UNZALU ZA 44370

P.O Box 50110
Lusaka, Zambia

Email: assistantdeanpgmedicine@unza.zm

22nd July, 2014

Ms Melody Mutinta
Department of Pharmacy
School of Medicine
UNZA
LUSAKA

Dear Ms. Mutinta,

RE: GRADUATE PROPOSAL PRESENTATION FORUM

Having assessed your dissertation entitled **"Accuracy and Completeness of Medication Histories in Patients in Medical Admission Ward at University Teaching Hospital ",** we are satisfied that all the corrections to your research proposal have been done. The proposal meets the standard as laid down by the Board of Graduate Studies.

You can proceed and present to the Research Ethics.

Yours faithfully,

Dr. S.H. Nzala
ASSISTANT DEAN, POSTGRADUATE
CC: HOD, Pharmacy

UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
22 JUL 2014
ASSISTANT DEAN (PG)
P.O. BOX 50110, LUSAKA

Appendix D: Clearance letter from UTH management

REPUBLIC OF ZAMBIA
HEAD
CLINICAL CARE
29 JUL 2014
UNIVERSITY TEACHING HOSPITAL
P/BAG RW 1X LUSAKA

UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
PHARMACY DEPARTMENT

Approved

Telegram:	**UNZA, Lusaka**	**Telephone:**	
Telex :	**UNZALU ZA 44370**	**Deans Office:**	**252641**
P.O. Box:	**50110**	**Departmental Office:**	**257635**

To,

The Head Clinical Care

UTH

28/7/14

Re: Mrs. Melody Mutinta; Computer No. 512807796

This is to inform you that the above named is a Masters' student presently in 3rd Year of her Masters in Clinical Pharmacy, UNZA.

Melody's research project is titled," Accuracy and completeness of medication histories in patients in Medical admissions ward at University Teaching Hospital."

As a department we seek your approval for the candidate to access the medical ward to enable her to carry out the research.

We look forward to working together to improve patient safety and overall care.

Sincerely,

Dr Lavina Prashar

Head; department of Pharmacy

School of Medicine

UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
06 JAN 2015
HEAD OF DEPARTMENT
DEPARTMENT OF MEDICINE
P.O. BOX 50110 - LUSAKA

Appendix E: Ethical approval from Research Ethics Committee

33 Joseph Mwilwa Road
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Tel: +260 955 155 633
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I.R.B. No. 00005948
F.W.A. No. 00011697

9th December, 2014

Ref. No. 2014-Sept-009

The Principal Investigator
Ms. Melody Mutinta
University Teaching Hospital
Dept. of Pharmacy
P/Bag RW 1X,
LUSAKA

Dear Ms. Mutinta,

RE: ACCURACY AND COMPLETENESS OF MEDICATION HISTORIES IN PATIENTS IN MEDICAL ADMISSION WARD AT UNIVERSITY TEACHING HOSPITAL.

Reference is made to your revisions dated 4th December, 2014. The IRB resolved to approve this study and your participation as principal investigator for a period of one year.

Review Type	Ordinary	Approval No. **2014-Sept-009**
Approval and Expiry Date	Approval Date: 9th December, 2014	Expiry Date: 8th December, 2015
Protocol Version and Date	Version-Nil	8th December, 2015
Information Sheet, Consent Forms and Dates	• English, Nyanja	8th December, 2015
Consent form ID and Date	Version-Nil	8th December, 2015
Recruitment Materials	Nil	8th December, 2015
Other Study Documents	Questionnaire, Medication History Documentation Form.	8th December, 2015
Number of participants approved for study	334	8th December, 2015

Specific conditions will apply to this approval. As Principal Investigator it is your responsibility to ensure that the contents of this letter are adhered to. If these are not adhered to, the approval may be suspended. Should the study be suspended, study sponsors and other regulatory authorities will be informed.

Conditions of Approval

- No participant may be involved in any study procedure prior to the study approval or after the expiration date.
- All unanticipated or Serious Adverse Events (SAEs) must be reported to the IRB within 5 days.
- All protocol modifications must be IRB approved prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address.
- All protocol deviations must be reported to the IRB within 5 working days.
- All recruitment materials must be approved by the IRB prior to being used.
- Principal investigators are responsible for initiating Continuing Review proceedings. Documents must be received by the IRB at least 30 days before the expiry date. This is for the purpose of facilitating the review process. Any documents received less than 30 days before expiry will be labelled "late submissions" and will incur a penalty.
- Every 6 (six) months a progress report form supplied by ERES IRB must be filled in and submitted to us.
- ERES Converge IRB does not "stamp" approval letters, consent forms or study documents unless requested for in writing. This is because the approval letter clearly indicates the documents approved by the IRB as well as other elements and conditions of approval.

Should you have any questions regarding anything indicated in this letter, please do not hesitate to get in touch with us at the above indicated address.

On behalf of ERES Converge IRB, we would like to wish you all the success as you carry out your study.

Yours faithfully,
ERES CONVERGE IRB

Dr. E. Munalula-Nkandu
BSc (Hons), MSc, MA Bioethics, PgD R/Ethics, PhD
CHAIRPERSON

Appendix F: Participant information sheet

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- 8 NOV 2014
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INFORMATION SHEET (To be kept by the Participant)

RESEARCH TITLE

ACCURACY AND COMPLETENESS OF MEDICATION HISTORIES IN PATIENTS IN MEDICAL ADMISSION WARD AT UNIVERSITY TEACHING HOSPITAL.

The Researcher

My name is Melody Mutinta, a student at University of Zambia. I would like to take some time to review the medicines you take at home.

The Research

This study intends to gather information on the accuracy and completeness of medication history documented in clinical records (medical notes and drug charts) at the time of your admission to hospital. An accurate and a complete medication history is important as it enables health care professionals to check for any actual or potential drug interactions between you're your prescribed medicines (e.g. medicines that cannot be taken with other medicines are corrected) thus improving safety of medicines.

You have been chosen to participate in this study because you satisfy the inclusion criteria (adult aged above 18 years, admitted to the medical admission ward, and you or your carer is able to communicate).

During the study, your clinical records will be reviewed and you will also be interviewed.

The Process

Participation will involve a one-on-one interview, lasting approximately fifteen minutes, at your bedside, or if you wish, in a private room. You will be asked a number of questions about your medicines. You may ask questions or raise concerns at any time during the interview. You are also free not to answer any question you may deem sensitive. You are free to withdraw from the study and your decision will not affect the quality of your treatment and care.

Benefits

The study will provide information for further research on drug-related admissions. The results of this study will be used to implement a process for obtaining and documenting an

accurate and a complete list of the patients' current medication upon the patient's admission to the hospital. Consequently, it will improve on communication of medicines information between different levels of care thus improve safety of medicines.

Risk

There are no risks associated with participating in the study. We will do our best to ensure that your confidentiality is maintained by not citing your name and identifying information within the actual study. We will not share your individual responses with anyone other than the researchers. We will keep the data in a secure place. Only the researchers will have access to this information. Upon completion of this project, all data will be destroyed or stored in a secure location.

This study has been approved by the Biomedical Research Ethics Committee of the ERES CONVERGE and their details are given below.

Contact details of the Researcher:

Melody Mutinta,

University Teaching Hospital, Pharmacy Department,

Private Bag RW 1X, LUSAKA

Tel: +260 966 743 914

Email: melodymbewe@yahoo.com

APPROVED
- 8 NOV 2014
ERES CONVERGE
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Contact details of the Biomedical Research Ethics Committee

The Chairperson

ERES CONVERGE I.R.B.

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PEPALA YA MBIRI (Lizasungudwa ndi wotengako mbali)

Mutu wofufuzira

ZOONADI NDI YOKWANIRA MBIRI YAMANKHWALA KWA WODWALA MU NYUMBA YA OSUNGILAMA WODWALA (MEDICAL ADMISSION WARD) PA CHIPATALA CHACIKULU CHA MU LUSAKA (UNIVERSITY TEACHING HOSPITAL)

Wofufuza

Dzina langa ndine Melody Mutinta, mwana wa sukulu pa sukulu la University of Zambia. Ndifuna kusanda-sanda pa mankhwala amene mukumwa kunyumba kwanu.

Kufufuza

Phunziro ili ndi lofufuza za mbiri nzati zoonadi ndi yokwanira mankhwala yolembedwa pa pepala la wodwala pa nthawi imene mwafika mu chipatala. Ndizoona ndi wokwanira mankhwala ndipo nkoyenera popeza kuzathandiza wosamalira moyo kuti awone ngati ndoyenera mankhwala amene alembedwa pa kapepala kotengelapo mankhwala mwachitsanso. Mankhwala amene sangamwedwe pamodzi ndi mankhwala ena, asinthidwa. Pakutero tikuteteza ubwino wa mankhwala.

Mwasankhidwa kutengako mbali mu phunziroyi cifukwa ndinu wa zaka zopitira pa zaka khumi zisanu ndi zitatu (18) ndipo muli mnyumba yosungilamo wodwala, wokusamalira muzagwirizana.

Panthawi ya phunziro, mapepala ya wodwala adzidzawaona ndiponso mu zafunsidwa mafunso.

Mdandanda

Mukatengako mbali pazakhala kukambirana inu ndi inei kwa mpindi khumi ndi zisanu (15 minutes) pa bedi yanu, kapena ngati mufuna mwachisinsi tipite mu chipinda. Muzafunsidwa mafunso angapo pa mankhwala. Mukhonza kufunsa mafunso kapena kufotokoza zili zones za ku khosi kwanu panthawi ya mafunso. Mulinso womasuka kusayankha funso ilionse imene mwaona kuti simungathe kuyankha. Mulinso womasuka kuleka kukhala mu phunziro yathu, mukatero mu zapitilirabe kulandira thandizo la mankhwala.

Ubwino

Phunziroli uthenga wache uthandiza katswili wofufuza ku dziwa za mankhwala yoyenera kukupatsani zotuluka mu phunziroli azidzagwiritsa nthchito ku komesanjira yopezeramo ndi kulemba mwa choonadi zeni-zeni zokhuza mankhwala amene wodwala anamwapo asabwere ku chipatala. Njirayi izakulitsa kudziwa za mankhwala,ndiponso uthenga wolembedwa pakati pa malo ofikilapo wodwala ndiponso pamene musungidwa mu chipatala po komesa ndi kuteteza mankwala.

Chiopsezo

Palibe chiopsezo chokukhuzani pa kutenga mbali mu phunziro. Tizachita zili zonse zotheka kuti pakhale cinsinsi posachula dzina lanu kapena podziwa za uthenga wa nphunziro lathu.sitizagawira anthu ena uthengawu kapena mayankho yanu, koma kwa wofufuza okha okha. Tizasunga bwino bwino mbiri yanu. Wokhawo wofufuza ndi amene azakhala ndi mpata wodziwa za mbiri yanu. Potsiliza ntchito yathu yofufuza, uthenga onse uzasungidwa pa malo abwino kapenanso kuufafaniza.

Phunziroli linavomerezedwa ndi a Biomedical Research Ethics committee, ERES CONVERGE IRB ndipo keyala ili munsimu;

APPROVED
- 8 NOV 2014
ERES CONVERGE
P/BAG 125, LUSAKA.

Keyala ya Wofufuza:

Melody Mutinta,

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Appendix G: Participant consent form

INFORMED CONSENT FORM (To be kept by the Researcher)

I confirm that I have understood the information given about the study. I agree to participate in the study. I confirm that I am joining the study out of my free will and that I can withdraw at any time without affecting the quality of care available to me.

I fully understand what will be required of me.

Name: .....

Signed (thumbprint): .....

Date: .....

I confirm that I have explained the information fully and answered questions.

Name: .....

Signed: .....

Date: .....

Contact details of the Researcher:

Melody Mutinta, University Teaching Hospital, Pharmacy Department, Private Bag RW 1X, LUSAKA.

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PEPALA LOVOMERA

Ndisimikiza namvesta za uthenga uli mu phunziro. Ndavomera kutengako mbali mu phunziro. Ndisimikiza kuti ndizatengako mbali mu phunziro mwaufulo ndi khoza kuleka nthawi ilionse ndipo sikusokoneza kasamalidwe kaine.

Ndamvestetsa zofunikira kwa ine.

Dzina: .....

kusaina: .....

Tsiku: .....

Ndisimikiza kuti ndafotokoza za uthenga mwatsatanetsane ndipo ndayankha mafunso.

Dzina: .....

kusaina: .....

Tsiku: .....

Keyala ya Wofufuza:

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Appendix H: Extracts of the SPSS analysis

PARTICIPANT INTERVIEWED

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Patient	171	53.1	53.1	53.1
	Caregiver	151	46.9	46.9	100.0
	Total	322	100.0	100.0	

GENDER OF PARTICIPANTS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	154	47.8	47.8	47.8
	Female	168	52.2	52.2	100.0
	Total	322	100.0	100.0	

ACCURACY OF MEDICATION HISTORIES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		35	10.9	10.9	10.9
	Accurate	112	34.8	34.8	45.7
	Inaccurate	175	54.3	54.3	100.0
	Total	322	100.0	100.0	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	140.322[a]	6	.000
Likelihood Ratio	89.199	6	.000
N of Valid Cases	322		

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is .54.

Appendix I: Proposed Medication History Documentation Form

Ministry of Health

University Teaching Hospital, Private Bag RW 1X, Lusaka

This form must be completed by practitioners clerking in patients on admission and filed in the patients file. Additional information can be added as it becomes available.

Patients' details	**Allergies:** (Tick and include reaction details)
Name:…….	Medication ( )……
Date of birth:…….	Chemicals ( )……
File No:…….	Food ( )……

Source of information: (Tick)

Patient ( ) / Caregiver ( ) Patient's own medicine ( )

Recent discharge ( ) date……. Repeat prescription ( ) date…….

Other ( ) specify……

Medications on admission (including herbal, vitamins and over-the-counter)				**Comments and changes on admission**
Medication name	Dose	Route	Frequency	Comments e.g. reasons why any medication is not prescribed

Additional information needed:	
Social history: (Tick)	**Adherence:** (Tick)
Alcohol ( )	Poor compliance ( )
Smoking ( )	Medications recently stopped ( )
Illicit drugs ( )	Courses completed ( )
	Patient brought medicines to the hospital ( )

	Print name	Designation	Signature	Date	Time
Completed by					
Amendments made by					