

**ASSESSMENT OF DISPENSING PRACTICES AND PATIENTS'
SATISFACTION WITH PHARMACEUTICAL SERVICES
OFFERED AT KENYATTA NATIONAL HOSPITAL
PHARMACIES.**

BY

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DECLARATION

I declare that this is my original work and has not been presented for a degree elsewhere.

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DEDICATION

This work is dedicated to my beloved Sister late Marinera Bamurigire, late mum Mukankusi Rosaria and father Higiroy Augustine, aunt Sr. Mukamwezi Annamary, uncles Gacinya Faustine and Lt.Gen. Kayonga Charles and their families whose love, care and guidance has made me what I am to day. Without forgetting my late uncle Butera Dick whose inspiration has led me to my Pharmacy career.

ABSTRACT

Background: The label on the dispensed medicines has two main functions. One is to uniquely identify the contents of the container. The other is to ensure that patients have clear and concise information which will enable them to take or use their medicine in the most effective and appropriate way. There are both legal and professional requirements which must be complied with when labelling a dispensed medicine. It is the pharmacist's / pharmacy staff's responsibility to ensure that these requirements are satisfied and that all labelling is accurate and comprehensive. Prescribing patterns need to be evaluated periodically to increase therapeutic efficacy, decrease adverse effects and provide feedback to prescribers. Availability of drugs at the point of need has been a matter of great concern for health services all over the world, especially for the less developed countries.

Patient satisfaction is a key indicator of the quality of health services, including pharmaceutical services.

Goal of Study: To improve the quality of pharmaceutical services at Kenyatta National Hospital.

Objective: To determine the drug labelling practices, pattern of prescribing, drug availability and the level of patient satisfaction with pharmaceutical services offered at KNH outpatient pharmacies.

Study Design: Hospital pharmacy-based cross-sectional study.

Study Area: Four selected pharmacies at the Kenyatta National Hospital.

Sampling Technique: A systematic random sampling was used.

Study Population: 392 patients who received drugs from Kenyatta National Hospital outpatient pharmacies between the months of April and October 2008.

Data Analysis: Data cleaning was done before analysis using SPSS software version 12 statistical package.

Results: Generally, the product name appeared most (98%) followed by directions for use (93%), “keep out of reach of children” (79%), quantity of medicine dispensed (62%), name and address of the pharmacy / logo of the hospital (55%), other cautionary statements (53%), expiry date (48%), patient name (23%), and prescription number (1%) and prescriber’s name (0%).

The average number of drugs per prescription was 2.9 during the study period. The most prescribed drugs were the cardiovascular system, anti-infectives and endocrine system drugs. Only 45.4% of the respondents got all their prescribed medication in the pharmacy. Patient knowledge was found to be satisfactory in 99.9% which indicated good pharmacy staff instructions to the respondents.

The overall satisfaction level of the patients in this study was 78.6%. There was no association observed between the level of satisfaction and the type of respondents, age, gender, marital status, education, employment and number of visits.

Conclusion: Most labelling requirements were met since majority of them were above 50%, there was satisfactory patients knowledge, the average number of drugs per prescription was 2.9 during the study period, however this was above the WHO recommendation of 1.6 drugs per patient per encounter, only 45.4% of the respondents got all their prescribed medications in the pharmacies, the most prescribed drugs were cardiovascular system, anti-infectives and endocrine system drugs. Satisfaction level of patients was good.

Recommendation: Prescriber’s number, name and address of the pharmacy should be in use for easy tracing of the root cause of any problem which may arise during medication use by patients. Prescribing of fewer drugs based on correct diagnosis should be implemented for the therapeutic benefits of patients. Better availability of drugs should be based on essential medicines lists and increasing of the hospital drug procurement budget.

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DEFINITION OF TERMS

Label	:	A piece of paper attached to an object to give information about it.
Dispensing	:	The act of making up and give out (Medicine) or administer
Prescribing Patterns	:	Habits of prescribing medicine
Availability	:	Obtainable of something
Satisfaction	:	Being satisfied
Patient	:	Person receiving medical treatment
Prescription	:	Means an order to take certain medications

ABBREVIATIONS AND ACRONYMS

ACEIs	: Angiotensin -Converting Enzyme inhibitors
ADEs	: Adverse Drug Events
CCC	: Comprehensive Care Centre
CNS	: Central Nervous System
CVS	: Cardiovascular System
ENT	: Ear, Nose and Throat
GIS	: Gastrointestinal System
INRUD	: International network for rational use of drugs
IOM	: Institute of Medicine
K	: Potassium
KNH	: Kenyatta National Hospital
PI	: Principal Investigator
REF.	: Reference.
RS	: Respiratory System
Rx	: Prescription
USA	: United States of America
USP PRN	: US Pharmacopeia Practitioners Reporting Network
WHO	: World Health Organization

CHAPTER I

1.0. INTRODUCTION

1.1. Background

It is widely recognized, in industrialized as well as developing countries, that adherence to recommended medication regimens is often poor, potentially resulting in treatment failure. Boonstra and colleagues showed how quality in processes of care, especially dispensing procedures and labelling of medicines affects patient knowledge which is seen as a prerequisite for adherence to medication. [1]

Good dispensing practices ensure that an effective form of the correct drug is delivered to the right patient, in the prescribed dosage and quantity, with clear instructions, and in a package which is well labelled and maintains the potency of the drug. Dispensing includes all the activities that occur between the time the prescription is presented and the medicine or other prescribed items are issued to the patient. A safe, clean and organized working environment provides a basis for good practice. Dispensing must be performed accurately and should be done in orderly manner, with disciplined use of effective procedures. Care should be taken to read labels accurately. The dispenser must count and measure carefully and guard against contamination of medicines by using clean equipment and avoiding handling of medicines. Staff who dispense must be qualified or trained in the knowledge, skills, and practices necessary to dispense the range of medicines being prescribed. Labels should contain information about the medicine and its correct use .The style and language of labelling should be appropriate to the needs of the patient. [2]

Ensuring the patient understands how to take their medicines is a primary responsibility of the dispensers. Dispensers should check understanding by asking each patient to repeat instructions. When all the criteria mentioned above are met by the pharmacy staff, patients are satisfied with the pharmaceutical services and this leads to safe and appropriate medication use. [2]

Patient satisfaction can be defined as patients' "personal evaluation of health care services and providers."¹³¹ Such satisfaction invariably reflects patients' expectations and perception of actual care provided.¹³¹ Understanding patient satisfaction and, hence, patients' preferences and expectations is essential in identifying voids in the delivery of health care services. By determining what patients expect of health care services, health care organizations can tailor services in ways that satisfy patients' desires and unmet needs.

Patient satisfaction can affect patients' health-related decisions and treatment-related behaviours, which can contribute to treatment success and improved health outcomes.^{14,51} Patient satisfaction has also been significantly predicted by success of treatment, medication compliance, follow-through with the treatment regimen, and use of services in an appropriate manner.^{16,71} Measures of patient satisfaction are used to compare health care programmes, to evaluate quality of care,¹⁸¹ to identify which aspects of a service need improvement,¹⁹¹ and to assist organizations in identifying which consumers are likely to unenroll.¹¹⁰¹

Health care organizations that focus on patient satisfaction demonstrate a willingness to build long-term relationships with their consumers and thus achieve a competitive advantage. To monitor their performance for quality improvement and quality management, health care organizations would conduct consumer evaluations on a regular basis.

Garman and colleagues¹¹¹ reported that "return-to-provider" behaviour is an important predictor of patient satisfaction. The continued patronage of patients is an indication of consumers being satisfied with their previous encounters. Patient satisfaction is valuable to health care organizations not only because of patients' continued use of services but also because such use can lead to referrals.

Patient satisfaction is affected by structure, process, and outcome variables associated with pharmaceutical services, as well as by patients' sociodemographic characteristics, physical and psychological statuses, and attitudes and expectations concerning various pharmaceutical services they receive.^{112,131} Therefore, overall patient satisfaction with pharmaceutical services is used as a proxy for quality of service.¹¹⁴¹

1.2. Problem Statement

Poor labelling can lead to several problems, among them adverse reactions, medication errors and irrational use of drugs.

Medically inappropriate, ineffective and economically inefficient use of pharmaceuticals commonly occurs in health care facilities. The costs of irrational drug use are enormous in terms of both scarce resources and adverse clinical consequences of therapies that may have real risks but no objective benefits.

Lack of patient satisfaction can lead to several things, among them lack of medication compliance, treatment failure, use of services in an inappropriate manner and patients changing to traditional healers. It is important that these issues be looked at and their prevalence known.

1.3. Study Justification

It is important to do such a study at KNH because no similar studies had been conducted to assess drug labelling, prescribing patterns, drug availability and patients' satisfaction with pharmaceutical services.

Prescribing patterns need to be evaluated periodically to increase the therapeutic efficacy, decrease adverse effects and provide feedback to prescribers.

Understanding patient satisfaction, preferences and expectations, is essential to identify voids in the delivery of health care services.

Medication errors occur frequently in our setups, though very few are reported in health institutions, and poor labelling is cited as a potential cause. This study therefore hopes to reduce these medication errors and other related issues thus improving treatment success in patients attending KNH.

The importance of studying patient satisfaction stems from the fact that knowing about health care services from the patient's viewpoint provides a key indicator of the quality of the health care system. It is anticipated that outcome of this study will engage policymakers, pharmacists and clinicians to work towards an integrated and standard system of patient medication information and improvement of patient satisfaction.

CHAPTER II

2.0. LITERATURE REVIEW

2.1. Drug labelling

Labelling is important, and efforts should be made to provide information about nature and contents of the preparation, the dosage regime to be followed and the identity of the intended patient. This is important even if the patient is illiterate, since another family member may be able to read the instructions. ^[2]

In some countries, small auxiliary labels are available with preprinted instructions such as “Shake well before using” or cautions such as “May cause drowsiness.” Where available they should be routinely used. ^[2]

In Kenya, irrational dispensing is prevalent in public health facilities with only about 10% of prescribed medicines being labelled appropriately. This was shown by a baseline survey of pharmaceutical situation in Kenya, 2003. ^[15]

According to the Institute of Medicine (IOM) 2006 report, on “Preventing Medication Errors”, more than half a million adverse drug events (ADEs) occur in the United States each year in outpatient settings. Problems with prescription drug (Rx) labelling were cited as the cause of a large proportion of outpatient medication errors and ADEs, as patients may unintentionally misuse a prescribed medicine due to improper understanding of instructions. ^[16]

Recent health literacy research has highlighted the alarmingly high prevalence of patients misunderstanding seemingly simple instructions and warnings placed on drug container labels. The elderly, those with limited literacy skills, and individuals managing multiple medication regimens were found to be at greater risk for making errors in interpreting container label instructions. The ability to understand drug container label instructions is critical, both as health literacy and medication safety concerns. This is especially true since other sources of patient medication information are often insufficient. ^[16]

In a study by Shrank, labels on most prescription drug containers highlighted the pharmacy name or logo rather than instructions on how to take the medication. ¹¹⁷¹

According to US Pharmacopeia Practitioners' Reporting Network (USPPRN), confusing, inaccurate or incomplete labels and packaging contributed to 21% of the actual or potential drug errors over a 1-year period (Diane Cousins, vice-president, USPPRN: reported as personal communication; 1999). ¹¹⁸¹

Beverley Orser, reported that medication errors contribute significantly to patient morbidity and mortality and are associated with a considerable cost to the health care system and that one contributing cause is the misidentification of drug due to incomplete labels. ¹¹⁸¹

In 1988,WHO found out that, the average dispensing time in 7 countries was 105 seconds, 54% of drugs were adequately labeled (8 countries) , and 71% of patients (16 countries) understood the correct information .¹¹⁹¹

In USA, Parker found that correct understanding of labels ranged from 67.1% to 91.1%. ¹²⁰¹

Brennan found that in Bronx, New York (2006) providing language-appropriate prescription drug labels could eliminate some of the medication errors responsible for 98,000 deaths each year in the United States. ¹²¹¹

According to a study by American Foundation for the Blind in 2007, old adults with reduced visual acuity or those with vision loss due to eye diseases are unable to access important instructions for use and safety information from prescription labels and consumer medication information and must rely on memory or depend on someone else for help. This shows the need of the pharmacists to intervene so as to prevent medication errors in this population. ¹²²¹

2.2. Pattern of prescribing and availability of Drugs

A survey in Pakistan by Hafeez and colleagues in 2004 on prescription and dispensing practices in public sector health facilities revealed that the average number of drugs per prescription turned out to be 2.7 out of which only 1.6 drugs were being dispensed. ^[23]

A study in Western Nepal by Lamichhane and colleagues on prescribing patterns and morbidity profile among outpatients in a teaching hospital in the year 2004 reported that the mean number of drugs was 1.99 and only 19.5% and 39.6% of drugs were prescribed by generic name and from the essential drug list respectively. Antibiotics and injections were prescribed in 26.4% and 0.96% of encounters respectively. Cetrizine, vitamins, amoxicillin, the combination of paracetamol and ibuprofen and ranitidine were most commonly prescribed and upper respiratory tract infection and acid peptic disease were the most common diagnosed. ^[24]

A study carried out at the pharmacy practice centre of the University of Nairobi by Karimi and colleagues in 2004 found up to 7 drugs were prescribed simultaneously and only 35.8% of prescriptions had one drug. The same report noted a similar hospital-based studies that had reported 3-5 drugs per prescription while studies carried out in Ethiopia primary health care centers showed a mean of 2.1. ^[25]

A study done in South Africa by Gorden on drug prescribing habits in private surgeries and public hospitals in 2006 found that average of 1.9 drugs were prescribed in private surgeries compared to 3.0 in public hospitals which was higher than the number recommended by WHO/International Network for Rational Use of Drugs (INRUD) which is 1.6 per encounter. ^[26]

A similar study on prescription pattern at a secondary health care facility in Ilorin, Nigeria by Akande and Ologe in 2007, reported that the average number of drugs per prescription in their health facility was 3.99 and only 40.9% of the prescriptions had all drugs prescribed available in the health facility. ^[27]

Another study on patterns of prescription and drug dispensing by Karande and colleagues of Mumbai, India in 2007 reported that the average number of drugs per encounter was 2.9. A high number of drugs prescribed (90.3%) conformed to a model list of essential drugs and were dispensed (76.9%) by the hospital pharmacy. Certain drugs (5.7%) prescribed as syrups were not dispensed, although they were available in tablet form. Most parents (80.8%) knew the correct dosages, but only 18.5% of drugs were adequately labeled.^[28]

A drug use study in Eritrean health facilities in September 1999 by Andom showed that the overall percentage of drugs adequately labelled was 50%, patients who had adequate knowledge on the use of their drugs was 80%, availability of key drugs was 91%, and availability of essential list drugs was 83%. It also reported that in 1995 key drug stock was 91%. The same authors noted a similar study by WHO/INRUD which had revealed patient knowledge about drug usage in Burkina Faso was 68% and in 12 other developing countries was between 27 to 83%.^[29]

In Laos in 2004, Keohavong and colleagues reported that at public health facilities the average number of drugs per prescription was about 2.5. Among the 3 items of the drugs prescribed per average encounter, 97% were dispensed from the facilities of which 67% were adequately labelled and 74% of the patients knew how to take the drugs they received^[30].

A study in Malaysia in 2007 by Zaheer Ud Din Babar and colleagues reported that In the public sector, median availability was very low, and only 25% of the generic drugs were available. In the private pharmacies, the median availability of all surveyed medicines was 43%. In dispensing doctors' clinics, the availability was 45%. Low availability of antiviral drugs such as indinavir, nevirapine, and zidovudine was found in public hospitals, private pharmacies, and dispensing doctors' clinics^[31].

In Nepal Shankar *et al* reported the high prescribing frequency of the antihypertensives such as amlodipine, enalapril and low dose aspirin reflected the high prevalence of cardiovascular diseases among the study population. The same study also noted that, prescribing of ranitidine was high and this reflected the high incidence of acid peptic disorders in that population.^[33]

Another study in south Africa by Truter reported high prescribing frequency of oral antidiabetic drugs which accounted 67.4% of all products prescribed and Biphasic insulin which was the most frequently prescribed type of insulin was associated to the Prevalence of diabetes mellitus in that study population.^[34]

A study in Uganda by Tumwikirize and colleagues on assessing the effects of cost sharing on availability of drugs and utilization of services in public health facilities reported that removal of the cost sharing policy in March 2001 resulted in improved availability of the essential drugs but there was no effect on prescription practices.^[34]

Shankar and colleagues of Manipal Teaching Hospital, Pokhara, Nepal In 2001 conducted a study and reported that the five commonly prescribed drug categories in their hospital were antiulcer drugs (24.15%), antibiotics (23.96%), antiasthma drugs (20.56%), antihypertensives (19.81%) and analgesic (15.09%) respectively and the prescribing frequency of individual drugs ,omeprazole was the most commonly prescribed antiulcer drug. Amoxicillin, beclomethasone and amlodipine were the most commonly prescribed antibiotics, antiasthma drugs and antihypertensives respectively.^[35]

2.3. Patients' Satisfaction with Pharmaceutical Services

Patient satisfaction can be defined as patients' "personal evaluation of health care services and providers".^[3]

The importance of studying patient satisfaction stems from the fact that knowing about health care services from patients' viewpoint provides a key indicator of the quality of health care system. Patients' views of health services point to the sources of deficiencies in the system and direct health professionals and administrators to take corrective actions.^[36]

Another study in Nigeria on patients' responses to waiting time in an out-patient pharmacy reported that patients' waiting time, if not shortened, affects patients level of satisfaction and also reported that patients of post-secondary education are not likely to be easily impressed and are more likely to be critical and impatient than patients of lower educational levels.^[37]

A study by Mitike of Ethiopia and colleagues on satisfaction with outpatient services in hospitals of Amhara Region reported that among the sociodemographic factors, age was associated with dissatisfaction.^[38]

A study by Oparah and colleagues in 2004 on assessment of patient satisfaction with pharmaceutical services in a Nigerian teaching hospital, found out that nearly half of the patients (46%) rated the amount of time the pharmacist offered to spend with them as poor. About one-third rated promptness of prescription service as poor. Only 49% felt satisfied with the pharmaceutical services.^[39]

Another study done by Montero and colleagues in Spain, 2006 on satisfaction amongst outpatients presenting in the hospital pharmacy department, found out that waiting time was considered normal by 51.8% and excessive by 18.4%. 56% of individuals considered the information received useful and 81.1% considered that staff friendliness was good. Care was inadequate by 18.1% and 47.7% pointed out that the attending pharmacist didn't identify him or herself.^[40]

According to a study by Mohamed and colleague in 2004 on patients' satisfaction with pharmaceutical services at teaching hospitals in Riyadh, Saudi Arabia, the overall mean satisfaction with pharmaceutical services was 55% and female patients tended to experience more satisfaction with the pharmaceutical services than their male counterparts. ^[41]

Larson and colleagues in Iowa (Canada), found that the overall satisfaction was 55.2%. ^[42]

In a similar study by Schneider and colleagues in 1992 on assessment of pharmaceutical care needs of ambulatory pharmacy patients, more than 70% of all respondents were in favour of talking with a pharmacist about their prescriptions, receiving easy to understand advice on potential problems and having their prescriptions thoroughly explained. The current dispensing services were also viewed as highly satisfactory by a majority of respondents. ^[43]

Sansgiry and colleagues in Houston, USA studied Health Care Services Offered by Health Plans, Health Clinics, and Pharmacies in 2006 and their findings were as follows: The majority of respondents (81.84%) were satisfied with pharmacy services, most respondents (86.33%) agreed that pharmacists dispensed prescriptions correctly, and the majority of respondents were content with the information and counseling provided by pharmacists on dosing (73.49%) and side effects (70.18%), as well as with the pharmacist's availability to provide this information (84.09%). Although more than one quarter (26.68%) of customers indicated that they had to wait a long time to get their prescription filled at the pharmacy, most reported that the pharmacist was friendly (84.08%) and prompt (76.46%) and spent enough time with them (72.58%). Nearly two thirds of respondents (62.04%) also indicated that the pharmacist addressed their concerns regarding the cost of prescription medications. ^[44]

In Eastern Ethiopia; Abdosh reported that the overall satisfaction level of hospital patients to be 54.1%. ^[45]

2.4. Goal of Study

To improve the quality of Pharmaceutical Services at Kenyatta National Hospital.

2.5 .Objectives

2.5.1. General

- To determine the drug labelling practices, prescribing patterns and the level of patients' satisfaction with pharmaceutical services offered at KNH Pharmacies.

2.5.2. Specific

- To find out the current drug labelling practices at KNH pharmacies.
- To investigate the prescribing patterns and availability of the drugs prescribed at KNH pharmacies.
- To determine patients satisfaction with services offered at KNH pharmacies.

2.6. Research Questions

- Is drug labelling at KNH pharmacies properly done?
- What are the prescribing patterns of drugs at KNH?
- Do patients get all prescribed drugs at KNH?
- To what extent are patients satisfied with pharmaceutical services at KNH pharmacies?

2.7. Materials and methods

2.8. Study Area

Kenyatta National Hospital Pharmacies were the sites of study. Kenyatta National Hospital is the largest university teaching and referral hospital in East and Central Africa. It has 9 pharmacies which serve both inpatients and out patients. Four of them were considered for this study because they served a big number of outpatients and these were: - Pharmacy 15, Staff Pharmacy, Casualty Pharmacy and Pharmacy 20 (paediatric pharmacy).

2.9. Study Design

This was a hospital pharmacy- based cross-sectional study.

The study was carried out over duration of six month, between the month of April and October.

2.10. Study Population

Patients who received drugs from Kenyatta National Hospital Pharmacies.

2.10.1. Inclusion criteria

- Patients who have been attended by the pharmacy staff and willing to participate in the study.

2.10.2. Exclusion criteria.

- Patients who have not been attended by Pharmacy Staff.

2.11. Ethical Considerations

- Permission to carry out the study was granted by from the ethics and research committee at Kenyatta National University (Appendix VI).
- Subjects were informed about the study objectives and procedures and the data collected was confidential and was used only for the stated research purposes.
- Data forms did not bearing patient name or pharmacy number. The patients were identified by study numbers.
- Data was kept under lock and passworded to restrict access.
- There were no risks to the patients during the study. Matters of concern in patient management were communicated in line with standard professional practice.
- Once the results were analyzed, the findings were communicated to the primary care givers to contribute in improving the quality of services at the KNH pharmacies.

2.12. Sampling Procedures

2.12.1. Sampling Technique

- To eliminate bias, systematic random sampling was employed. Data were obtained from every 10th patient, in two working days per week.

2.12.2. Sample Size

Because prevalence is not known on the issue of labeling, prescribing patterns, drug availability and patients' satisfaction, a sample size of 392 patients was used, assuming the prevalence is 50% at 5% confidence interval and 5%.

2.13. Data Collection Techniques

A combination of data collection techniques was used to obtain necessary information. These were; use of standard questionnaire, observation, and interviews. Patients' satisfaction was determined by the use of a standard questionnaire (Appendix IV). Drug labelling ,prescribing patterns and drug availability was assessed through observation and filling in a standard reporting form (Appendix V) and Patients knowledge about prescribed drugs was assessed through interviews. The following questions were asked regarding the patient knowledge: How much? How often? And how to use their prescribed medications properly? Their answers were filled in the space provided for patient knowledge in a standard reporting form (Appendix V).

2.14. Data Management & Analysis.

Data were verified and analyzed by computer using SPSS software, version 12.0 statistical package. The 95% confidence level was used to assess statistical significance. The Pearson chi-square test was used in assessing the statistical significance of association.

CHAPTER III

3.0. RESULTS

3.1. Sociodemographic profile

3.1.1. Type of respondents

The study sample consisted of 392 respondents out of which 56.9% were patients and 43.1% were of parents/guardians.

Table 1: Type of Respondents

Type	Count	Percentage
Patient	223	56.9
Parent/Guardian	169	43.1

3.1.2. Age Distribution

The respondents were in the range of 15 to 80 years with the majority in the age group of 21-30 years (29.1%), followed by 31-40 years (28.3%).

Table 2: Age of the Respondents

Age class (Years)	Count	Percentage
11-20	16	4.1
21-30	114	29.1
31-40	111	28.1
41-50	68	17.4
51-60	50	12.8
61-70	24	6.1
71-80	8	2.0

3.1.3. Gender Distribution

The Sample was composed of 47.4% male and 52.6 % female.

Table 3: Gender Distribution of the Respondents

Gender	Count	Percentage
Male	186	47.4
Female	206	52.6

3.1.4. Marital Status Distribution

The Majority of respondents were married (74.5%) and the rest were single (25.5%).

Table 4: Marital Status Distribution of the Respondents

Marital Status	Count	Percentage
Single	100	25.5
Married	292	74.5

3.1.5. Education Background

Nearly 98% of respondents had formal education.

Table 5: Education Background of Respondents

Education	Count	Percentage
Informal	9	2.3
Primary	81	20.7
Secondary	179	45.7
College/University	123	31.4

3.1.6. Employment Background

Table 6: Employment Background of Respondents

Employment	Count	Percentage
Employed	140	35.8
Self employed	137	35.0
Unemployed	114	29.2

3.1.7. Number of visits to KNH Pharmacies

Most respondents had more than one visit to KNH pharmacies for their prescription refill.

Table 7: Number of Visits to KNH Pharmacies by the Respondents

Number of Visits	Count	Percentage
Once	59	15.1
More than Once	332	84.9

3.2. Drug labelling Practices and Patients' Knowledge on the use of Drugs.

3.2.1. Drug Labelling Practices

The percentage compliance to the legal labelling requirements was as in table 8.

Table 8: Standard Prescription Labelling Requirements

Standard Labeling	Count	Percentage
Product Name	765	98.4
Direction of use	721	92.8
Keep out of reach of children	611	78.6
Quantity of Medicine	483	62.1
Name and address of the pharmacy	424	54.5
Other cautionary statements	413	53.1
Expiry date	371	47.8
Patient's Name	182	23.4
Date of dispensing	109	14.0
Prescription Number	8	1.0
Prescriber's Name	0	0.0

3.2.2. Patients' Knowledge on the use of drugs

It was observed that, respondent's overall percentage adequate knowledge on the use of dispensed drugs was (99.9%). This showed that good explanations were being given to the patients by KNH pharmacy staff.

3.3. Prescription Patterns and Drug Availability

3.3.1. Most Commonly Prescribed Groups of Drugs among KNH Outpatients

Three hundred and ninety two prescriptions were analyzed during the study period. The average number of drugs per prescription was 2.9 and the range was from 1-7. It was observed that brand name prescribing was more than generic name prescribing however it was not formally assessed.

Out of the total of 1137 drugs prescribed during the study period, the 13 prescribed drug categories (Classified according to BNF, Vol.52, Sept 2006) are shown in table 9.

Table 9: Commonly Prescribed Groups of Drugs

Class	No of Prescriptions	Percentage
Cardiovascular system drugs	347	30.5
Anti-infective drugs	199	17.5
Endocrine System drugs	162	14.2
Central nervous system drugs	158	13.9
Respiratory system drugs	111	9.8
Gastrointestinal system drugs	65	5.7
Nutrition & blood Drugs	45	4.0
Ear, nose and throat preparations	14	1.2
Topical preparations	13	1.1
Eye preparations	12	1.1
Cytotoxic drugs	5	0.4
Miscellaneous	4	0.4
Vaccines	2	0.2
Total	1137	100/%

3.3.2. Drugs acting on Cardiovascular System

Enalapril and captopril were commonly prescribed ACEIs but enalapril was prescribed more than captopril and less dispensed in comparison with captopril.

Among the calcium channel blockers amlodipine and nifedipine were most commonly prescribed but dispensed in varying degrees. In the class of antiplatelets Aspirin 75mg was commonly prescribed and more than 50% was dispensed.

Among the beta blockers atenolol, carvedilol and propranolol were prescribed and dispensed in decreasing order respectively.

Losartan was the only angiotensin II receptor antagonists prescribed and more than half was dispensed.

Thiazide prescribed hydrochlorthiazide was most the commonly but was not available at KNH pharmacies so none was dispensed.

Among the lipid regulating drugs atorvastatin was the only one prescribed and less than half was dispensed.

In loop diuretics furosemide was prescribed in this class and more than half was dispensed.

Among K sparing and aldosterone antagonists, spironolactone was the only one prescribed and was poorly dispensed.

Generally out of total cardiovascular drugs prescribed 61.1% were dispensed (Table 10).

Table 10: Prescribed and dispensed cardiovascular system drugs

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of dispensed drugs	
					Count	Percentage
Vasodilator antihypertensives	3	0.9	Hydralazine	3	2	66.7
Centrally acting Antihypertensives	3	0.9	Methyldopa	3	0	0
ACE inhibitors	74	21.3	Enalapril	56	47	84
			Captopril	18	17	94
Angiotensin II Receptor antagonists	26	7.5	Losartan	26	16	62
Calcium channel brokers	50	14.4	Amilodipine	13	13	100
			Nifedipine	37	31	84
Beta Blockers	47	14	Atenolol	27	24	89
			Carvedilol	17	8	47
			Propanolol	3	0	0
Nitrates	2	0.6	Montrate	2	0	0.0
Fixed dose combination antihypertensives	2	0.6	Amzart	1	0	0.0
			Tenoretic	1	0	0.0
Thiazides&Related Diuretics	25	7.2	Hydrochlorthiazide	19	0.00	0
			Indapamide	1	0.00	0
			Benduric	5	2	40
Loop diuretics	18	5.2	Furosemide	18	11	61.1
K sparing&Aldostero	10	3	Spironolactone	10	1	10.0

ne Antag.						
Fixed dose combination diuretics	4	1.2	Moduretic	4	3	75
Cardiac glycosides	1	0.3	Digoxin	1	1	100
Anticoagulants	6	1.7	Heparin	1	0	0
			Warfarin	5	4	80
Antiplatelets	38	11	Asprin75mg	37	22	59.5
			Clopidogrel	1	0	0.0
Antifibrinolytics&haemostatics	2	0.6	Dicynone	1	0	0.0
			Tranexamic acid	1	0	0.0
Lipid regulating drugs	36	10	Atorvastatin	36	10	28
Total	347	100		347	212	61.1

3.3.3. Drugs Acting on respiratory system

Drugs acting on respiratory system accounted for 14.2% of all prescribed drugs (Table 11). The prevalence of prescribing is shown in table 11. More than 50% of the prescribed drugs were dispensed.

Table 11: Prescribed and Dispensed Respiratory System drugs

Class	No. of Prescriptions	Frequency % of Total	Specific Drug	No. of Prescriptions	Frequency of dispensed drugs	
					count	Percentage
Selective B2 Agonists (S.A)	14	13	Salbutamol Inh.	14	11	79
Theophyllines	2	2	Theophylline	2	2	100
Corticosteroids	8	7	Budesonide Inh.	8	2	25

Mucolytics	30	27	Mucosolvan	15	13	87
			Ascoril	11	1	9
			Rhinathiol	3	0	0.0
			Solvin Plus	1	0	0.0
Expectorant	1	1	Actifed Exp	1	0	0.00
Antihistamines	56	51	Chlorpheniramine	7	5	71
			Cetirizine	42	28	67
			Hydroxyzine	1	0	0.00
			Letrizine	1	0	0.00
			Promethazine	2	0	0.00
			Ebastine	1	0	0.00
			Celestamine	1	0	0.00
			Dazit5	1	0	0.00
Total	111	100		111	62	56

3.3.4. Anti-infective drugs

Anti-infective drugs accounted for 17.5% of all prescribed drugs (Table 12). The prevalence of prescribing in decreasing order was penicillins, amoebicides, antifungals, cephalosporins, macrolides, and lastly other antibiotics. 77.3% of anti-infective drugs prescribed were dispensed.

Table 12: Prescribed and Dispensed anti-infective drugs

Class	No. of Prescriptions	Frequency % total	Specific Drug	No. of Prescriptions	Frequency of dispensed drugs	
					Count	Percentage
Penicillinase Resistant Penicillins	11	6	Flucloxacillin	11	10	91
Broad Spectrum Penicillins	67	34	Amoxillin	21	18	86
			Augmentin	44	35	80
			Ampiclox	2	0	0
Cephalosporins	17	8.5	Cefadroxil	1	0	0.00
			Cefuroxime	16	15	94
Fluoroquinolones	13	7	Ciprofloxacin	8	7	88
			Norfloxacin	5	4	80
Macrolides	16	8	Clarithromycin	9	7	78
			Azithromycin	5	5	100
			Erythromycin	2	2	100
Tetracyclines	7	4	Doxycycline	7	6	86
Lincosamides	4	2	Clindamycin	4	4	100
Sulphonamides&Trimethoprim	5	3	Cotrimoxazole	5	5	100
Other Antibiotics	2	1	Nitrofurantoin	1	0	0
			Vancomycin	1	0	0
Antifungal drugs	19	10	Clotrimazole	13	11	85
			Fluconazole	5	0	0
			Griseofulvin	1	0	0
Antiviral Drugs	3	1.5	Acyclovir	2	1	50

			Valacyclovir	1	0	0
Antimalarials	11	6	Coartem	8	3	38
			Paludrine	2	2	100
			Halofantrine	1	0	0
Amoebicides	21	11	Metronidazole	18	17	94
			Secnidazole	1	0	0
			Ornidazole	1	0	0
			Entamizole	1	0	0
Anthelmintics	3	1.5	Albendazole	3	2	67
Total	199	100		199	154	77.3

3.3.5. Drugs Acting on Endocrine System

In this group antidiabetic drugs were more prescribed than the rest (Table 13). Insulin was highly prescribed (47%), followed by biguanides (30.2%) among antidiabetics, prednisone was most prescribed among the rest of endocrine system drugs. More than 50% of the prescribed drugs were dispensed.

Table 13: Prescribed and Dispensed endocrine drugs.

Class	No. of Prescriptions	Frequency % of Total	Specific Drug	No. of Prescriptions	Frequency of dispensed drugs	
					Count	Percentage
Antidiabetics						
Insulin	76	47	Mixtard	76	67	88
Sulphonyl ureas	13	8	Glibenclamide	9	8	89
			Glimepiride	2	1	50
			Gliclazide	2	0	0
Biguanides	49	30.2	Metformin	49	35	71

Other antidiabetics	6	4	Pioglitazone	6	6	100
Other Endocrine system Drugs						
Thyroid hormones	1	0.6	Thyroxine Na	1	1	100
Antithyroid drugs	1	0.6	Carbimazole	1	1	100
Contraceptives	2	1.2	Microgynon	1	0	0
			Medroxy Progesterone	1	0	0
Corticosteroids	14	9	Prednisone	9	8	89
			Dexamethasone	2	0	0
			Prednisolone	3	2	67
Total	162	100		169	129	76.3

3.3.6. Drugs Acting on GI System

Proton pump inhibitors (55.3%) were highly prescribed, followed by antacids and Simeticone (17%), antimuscarinics (10%) and H₂ receptor antagonists respectively. Omeprazole was the most frequently prescribed drug for the GIT. More than 50% in this group were dispensed

(Table 14).

Table 14: Prescribed and Dispensed GI drugs

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of Dispensed	
					Count	Percentage
Antacids & Simeticone	11	17	Flatameal	1	1	100
			Viscid	9	8	89
			Maalox	1	0	0

H2 Receptor antagonists	6	9.2	Ranitidine	5	5	100
			Cimetidine	1	0	0
Proton Pump Inhibitors	36	55.3	Pantoprazole	1	0	0
			Omeprazole	31	28	90
			Esomeprazole	4	1	25
Antimuscarinics	10	15.4	Buscopan	10	8	80
Dopamine Antagonists	1	1.5	Motilium	1	0	0.0
Osmotic Laxatives	1	1.5	Duphalac	1	1	100
Total	65	100		65	52	80

3.3.7. Drugs Acting on CNS

Non-opioid analgesics were highly prescribed (74.1%), followed by anticonvulsants (11%), antidepressants (9%) and benzodiazepines (3.3%). Among non-opioid analgesics, diclofenac and paracetamol were most commonly prescribed followed by ibuprofen. In the class of antidepressants amitriptyline was highly prescribed. Among anticonvulsants carbamazepine was highly prescribed followed by sodium valproate. At least seventy three percent of the prescribed drugs in this group were dispensed (Table 15).

Table 15: Prescribed and Dispensed CNS Drugs

Class	No. of Prescriptions	Frequency % of Total	Specific Drug	No. of Prescriptions	Frequency of dispensed drugs	
					Count	Percentage
Benzodiazepines	5	3.3	Diazepam	2	2	100
			Bromazepam	2	1	50
			Lormetazepam	1	0	0
Drugs for Psychotic	1	0.6	Haloperidol	1	1	100

disorders						
Antidepressants	14	9	Amitriptyline	8	6	75
			Imipramine	1	0	0
			Fluoxetine	4	3	75
			Mirtazapine	1	0	0
Analgesics						
Non opioid Analgesics	117	74.1	Ibuprofen	24	19	79
			Diclofenac	38	33	87
			Meloxicam	13	7	54
			Paracetamol	38	28	74
			Nimesulide	1	0	0
			Piroxicam	2	0	0
			Mefenamic Acid	1	0	0
Opioid Analgesics	4	3	Tramadol	3	0	0
			Dihydrocodeine	1	0	0
Anticonvulsants	17	11	Phenytoin	1	1	100
			Phenobarbitone	1	1	100
			Na Valproate	5	5	100
			Carbamazepine	10	8	80
Total	158	100		158	115	73

3.3.8. Drugs Acting on ENT

Nasal sprays and decongestants were highly prescribed (50%), followed by drugs acting in mouth and throat (43%) and drugs acting in the ear (7%). Over 50% of the prescribed drugs in this group were dispensed (Table 16).

Table 16: Prescribed and Dispensed ENT Drugs

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of dispensed	
					Count	Percentage
Drugs Acting in the ear	1	7	Allerdex ear drops	1	0	0
Drugs acting in mouth & Throat	6	43	Wokadine	4	4	100
			Betadine M/W	2	2	100
Nasal Sprays & Decongestants	7	50	Mometason e furoate n/S	4	2	50
			Probeta-N	2	0	0
			Nasivion S	1	0	0
Total	14	100		14	8	57.1

3.3.9. Eye Preparations

50% of the prescribed drugs were dispensed (Table 17).

Table 17: Prescribed and Dispensed Eye Preparations

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of dispensed	
					Count	Percentage
Antibacterial	2	17	Ceprolen	1	1	100
			Doxycycline	1	1	100
Steroid only	4	33	ivydexone	2	1	50
			Dexamethasone	2	1	50
Steroidal/Anti bacterial	4	33	Dexa-G	3	0	0
			Dexa-Neo	1	0	0
Non steroidal anti-allergic ophthalmics	2	17	Lodoxamide	1	1	100
			Ivyzinc	1	1	100
Total	12	100		12	6	50

3.3.10. Cytotoxic drugs

For cytotoxic drugs, only antimetabolites were prescribed and methotrexate was the most commonly drug prescribed. only 20% in this group were dispensed.(Table 18).

Table 18: Prescribed and Dispensed Cytotoxic drugs

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of dispensed	
					Count	Percentage
Antimetabolites	5	100	Methotrexate	4	1	25
			Capecitabine	1	0	0
Total	5	100		5	1	20

3.3.11. Topical Preparations

For topical preparations, both antifungal agents and analgesics were equally prescribed (46%) each. More than 50% of the prescribed drugs in this group were dispensed (Table 19).

Table 19: Prescribed and Dispensed Topical Preparations

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of dispensed	
					Count	Percentage
Antibacterial	1	8	Zupricin	1	0	0
Antifungal	6	46	Candid Cream	4	4	100
			Daktarin cream	1	1	100
			Lamisil Cream	1	0	0
Analgesics	6	46	Diclofenac gel	3	3	0
			Feldene	2	0	0
			Deep Relief	1	0	0
Total	13	100		13	8	62

3.3.12. Immunological products & Vaccines

Only anti-rabies vaccine was prescribed and dispensed.

3.3.13. Nutrition & Blood

Vitamins were highly prescribed (69%) followed by haematinics (31%). In the class of haematinics ranferon was mostly prescribed and the prescribing of multivitamins was generally high. In this group more than 50% was dispensed (Table 20).

Table 20: Prescribed and Dispensed Nutrition & Blood drugs

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of dispensed	
					Count	Percentage
Haematinics	14	31	Ranferon	7	5	71
			Fefol	1	1	100
			Folic Acid	2	2	100
			Saferon	2	1	50
			Folate	2	1	50
Vitamins	31	69	Multivitamins	10	7	70
			Neurobion	5	3	60
			Neuroforte	6	3	50
			Bonium	5	0	0
			Forceval	2	0	0
			Trinerve	3	3	100
Total	45	100		45	26	58

3.3.14. Miscellaneous drugs

Table 21: Prescribed and Dispensed Miscellaneous drugs

Class	No. of Prescriptions	Frequency % of total	Specific Drug	No. of Prescriptions	Frequency of dispensed	
					Count	Percentage
Enzymes	1	25	Kon tab	1	0	0
ORS	2	50	ORS	2	2	100
Herbal drugs	1	25	Manix	1	0	0
Total	4	100		4	2	50

3.4. Patients Satisfaction with Services Offered at KNH Pharmacies

The surveyed items on patient satisfaction covered three aspects of services and those were: prescription services, medication therapy, management and interactions plus overall pharmacy services experience.

3.4.1. Prescription Services

Most respondents (86%) agreed that pharmacy staff dispensed prescriptions promptly but more than half of the respondents (54.6%) did not get all prescribed medications (Table 22).

Table 22: Surveyed items on Prescription Services and Patients Responses

Items Surveyed	Count & Percentage of Respondents Response					
	Yes	Percentage	No	Percentage	No Response	Percentage
1. Pleased with the Promptness of prescription drug services.	337	86	55	14	-	-
2. Medication availability in the Pharmacy.	178	45.4	214	54.6	-	-

3.4.2. Medication Therapy, Management and Interactions

Majority of the respondents (86.4%) were satisfied with the pharmacy staff regarding how well they instructed them how to take their medications. The amount of time the pharmacy staff spent with the respondents was adequate for them to understand well (74%) and respondents were impressed by their handling by the pharmacy staff (90.6%) and were comfortable with the environmental appearance of the pharmacy (83.9%). The pharmacy staff who served them wore a white apron with identification (80.4%), respondents who indicated that they had asked questions for clarifications (27.7%) and respondents who asked questions and were satisfied with the answers (88%) (Table 23).

Table 23: Surveyed items on Medication Therapy, Management and Interactions.

Items Surveyed	Count & Percentage of Respondents Response					
	Yes	Percentage	No	Percentage	No Response	Percentage
1. How well the Pharmacy staff instructed the respondents how to take their medications.	338	86.4	53	13.6	1	.3
2. Pleased with the amount of time the pharmacy staff spent with the patient.	288	74.0	101	26.0	3	.8
3. Patients asked the pharmacy staff questions for clarifications.	108	27.7	282	72.3	2	.5
4. If Yes, Those who were satisfied / not satisfied with the pharmacy staff answers.	95	88.0	11	10.0	2	2.0
5. Impressed by the handling of patients by the pharmacy staff.	355	90.6	36	9.2	1	.3
6. Pharmacy staff dressed in a white apron with identification.	315	80.4	58	14.8	19	4.8
7. Comfortability with the professional appearance of the pharmacy.	329	83.9	60	15.3	3	.8

3.4.3. Overall Pharmacy Services experiences

Most respondents (78.1%) were satisfied with the outpatient pharmacy services at KNH, 15.1% were neutral and 6.9% were dissatisfied.

Table 24: Surveyed item on Overall Pharmacy Service Experience

Item surveyed	Status of Satisfaction					
	Satisfied		Neutral		Dissatisfied	
The Pharmacy services overall.	Count	Percentage	Count	Percentage	Count	Percentage
		306	78.1	59	15.1	27

3.4.4. Association between Type of Respondent and Level of Satisfaction

Patients were more satisfied (81.2%) than parents/guardians (74.0%) and more guardians (8.9%) were dissatisfied than patients (5.4%) but the association was not statistically significant.

Table 25: Association between the type of respondent and level of satisfaction

Type of Respondents	Status of Satisfaction							P Value
	Satisfied		Neutral		Dissatisfied		Total	
	Count	%	Count	%	Count	%		
Patient	181	81.2	30	13.4	12	5.4	223	0.200
Parent/Guardian	125	74.0	29	17.1	15	8.9	169	
Total	306		59		27		392	

3.4.5. Association between age and level of satisfaction

There appeared to be an increase in satisfaction with the age but level of satisfaction and age was not statistically significant.

Table 26: Association between Age and Level of Satisfaction

Age Class	Status of Satisfaction						P Value	
	Satisfied		Neutral		Dissatisfied			Total
	Count	%	Count	%	Count	%		
11-20	12	75.0	4	25.0	0	0.0	0.230	
21-30	86	75.4	17	15.0	11	9.6		
31-40	80	72.1	23	20.7	8	7.2		
41-50	55	80.9	10	14.7	3	4.4		
51-60	41	82.0	5	10.0	4	8.0		
61-70	23	95.8	0	0.0	1	4.2		
71-80	8	100	0	0.0	0	0.0		
Total	305	78	59	15.1	27	6.9		391

3.4.6. Association between gender and level of satisfaction

There was no significant association between gender and satisfaction.

Table 27: Association between gender and level of satisfaction

Gender	Status of Satisfaction						P Value	
	Satisfied		Neutral		Dissatisfied			Total
	Count	%	Count	%	Count	%		
Female	162	78.6	29	14.1	15	7.3	0.823	
Male	144	77.4	30	16.1	12	6.5		
Total	306	78.1	59	15.1	27	6.8		

3.4.7. Association between marital status and level of satisfaction

There was no significant association between marital status and satisfaction.

Table 28: Association between marital status and level of satisfaction

Marital Status	Status of Satisfaction						P Value	
	Satisfied		Neutral		Dissatisfied			Total
	Count	%	Count	%	Count	%		
Single	82	82	12	12	6	6	0.535	
Married	224	76.7	47	16.1	21	7.2		
Total	306	78.1	59	15.1	27	6.8		

3.4.8. Association between education and level of satisfaction

Although there was a trend for more educated respondents to be less satisfied, the trend was not statistically significant (Table 29).

Table 29: Association between education and level of satisfaction

Education	Status of Satisfaction						Total	P Value
	Satisfied		Neutral		Dissatisfied			
	Count	%	Count	%	Count	%		
Informal	9	100	0	0.0	0	0.0	9	0.395
Primary	67	82.7	11	13.6	3	3.7	81	
Secondary	140	78.2	27	15.1	12	6.7	179	
College/ University	90	73.2	21	17.1	12	9.8	123	
Total	306	78.1	59	15.1	27	6.9	392	

3.4.9. Association between employment and level of satisfaction

Although there was a trend for employed respondents to be less satisfied, the trend was not statistically significant (Table 30).

Table 30: Association between employment and level of satisfaction.

Employment	Status of Satisfaction							P Value
	Satisfied		Neutral		Dissatisfied		Total	
	Count	%	Count	%	Count	%		
Employed	104	74.3	25	17.9	11	7.9	140	0.156
Self Employed	105	76.6	24	17.5	8	5.8	137	
Unemployed	97	85.1	9	7.9	8	7.0	114	
Total	306	78.3	58	14.8	27	6.9	391	

3.4.10. Association between number of visits and level of satisfaction

There was no statistically significant association between number of visits and satisfaction.

Table 31: Association between the number of visits and level of satisfaction.

Number of Visits	Status of Satisfaction							P Value
	Satisfied		Neutral		Dissatisfied		Total	
	Count	%	Count	%	Count	%		
Once	48	81.4	8	13.6	3	5.0	59	0.763
More than Once	257	77.4	51	15.4	24	7.2	332	
Total	305	78	59	15.1	27	6.9	391	

CHAPTER IV

4.0. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

4.1. Discussion

4.1.1. Drug labelling practices

Although manufacturers are required to provide appropriate labelling of medications, patients who are inexperienced in the interpretation of medication labels may have difficulty reading and understanding label instruction. ^[48] These difficulties could result in misuse of the product, leading to adverse events or drug interactions with prescription medications or other OTC medications. ^[49]

To help prevent these problems, pharmacy staff should be prepared to properly label the prescribed drugs and at some point during the dispensing process give instructions to patients. Ideally, this explanation would include the reasons why each particular medication is being given, how each drug should be taken, and any precautions or possible side effects. Increasing patient knowledge of drug therapy is said to improve compliance and may reduce adverse drug reactions.

According to the legal requirements on the dispensing practice of labeling, the items that should appear on any given label of medication include; product name, directions for use, patient name, date of dispensing, name and address of the pharmacy, prescriber's number and prescribers' name, expiry date, "keep out of reach of children", the quantity of drugs dispensed and other cautionary statements. ^[46, 47]

Some of the above requirements should be re-emphasized in dispensing practices since they are very important and if any item is missing from the label of the dispensed medications it can lead to medication errors such as wrong medication, wrong patient, expired medication and improper handling or use of medication.

The importance of the product name which appears on the label is to identify the exact prescribed product and must be the same name as the one which appears on the prescription. The product may be prescribed generically but only available as branded product; however, the prescribed name must be used. The reason for this is to avoid the patient becoming confused with a variety of names.^[47]

Providing directions for the use of prescribed medication is important in that it promotes rational use of the medication. Ideally no patient should leave a pharmacy counter without knowing how much, how often and how to use his or her medication. Although the label should be seen as back up to the verbal counseling and advice given by the pharmacy staff, it is still essential to ensure that the wording on the label is clear, concise and comprehensive to the patient.

The name of the patient for whom the medication has been prescribed is another important legal requirement which should not be missed on the labels of the dispensed medications and if possible, the status of the patient, ie. Mr, Mrs, Miss, Master, child or baby should be included in order to clearly differentiate from other members of a household, where there may be persons with the same name and full first name should be used if possible rather than an initial.

The name and address of the pharmacy are important also in that, in case any problems arising from dispensing mistakes can easily be followed up.

Normally the quantity of the prescribed drugs is essential to be labelled because it helps the patient to know how many they are supposed to take. The quantity which appears on the label should be the quantity which has been prescribed. However, in some cases multiple packs are required to complete a prescription. In these instances, when more than one container of the same medicine is dispensed, the quantity on the label should be the amount in each container or package. Date of dispensing is important in that, it reminds the patient of the date the prescription was dispensed and permits an estimate of how much has been taken in a certain time.^[47]

“Keep out of reach of children” is another legal requirement which should not be missed to be labelled on all dispensed medicines because it helps in preventing accidental consumption of the medicines by the young ones.

Expiry date is not normally necessary to put on label of dispensed medicine since manufacturers' expiry dates relate to ideal storage conditions but expiry dates are required on the label when dispensing diluted, sterile and extemporaneous preparations. While prescribers' name and number are also of importance on the labels of dispensed medicines they can facilitate to locate prescriber during prescribing mistakes.

Other cautionary statements are such as; “may cause drowsiness, avoid alcoholic drink” etc may be added when applicable.^[47]

In this study a total of 777 dispensed drugs were evaluated and the compliance to the requirements were as follows ; the product name appeared most (98.4%) followed by directions for use (93%), keep out of reach of children(79%), quantity of medicine dispensed (62%), name and address of the pharmacy / logo of the hospital (55%), other cautionary statements (53%), expiry date (48%), patient name (23%), prescription number (1%) . The prescriber's name was missing on all the labels.

A baseline survey conducted in public health facilities in Kenya in 2003 indicated that only 10% of the prescribed medicines were labelled appropriately.^[15] Drug use studies in Eritrea revealed the overall percentage of drugs adequately labelled was 50%.^[29] In Laos, 67% of dispensed drugs were adequately labelled.^[30] This study did not assess the total percentage of drugs being labelled appropriately; it only assessed the standard labelling requirements which was found to be above average as most of them were met.

A study conducted in USA indicated that labels on most prescription drug containers highlighted the name or logo rather than instructions on how to take the medication.^[17] The same study also reported that the pharmacy name or logo of the pharmacy was the most prominent on 84% of the labels evaluated. This study did not assess the most prominent item on the label but it was evident that the name /logo of the hospital appeared more often than some of the other labelling requirements such as name of the patient, date of dispensing, expiry date, prescription number, prescriber's name and other cautionary statements.

The style and language of labelling should be appropriate to the needs of the patient;^[21] it has been suggested that providing language- appropriate prescription drug labels could eliminate medication errors. ^[21] In KNH English was the language used in labelling and 2.3% of the respondents had informal education and were unable to read and correctly state 1 or more of the label instructions in English but stated it in Kiswahili however they knew how to use their medications. Probably this knowledge might have resulted from the number of revisits to the pharmacies as majority of them were on chronic medications as indicated by the prescribing prevalence. This study did not assess labelling style and Kiswahili as an alternative labelling language. Even if patients could speak Swahili, they may not have been able to read it.

4.1.2. Patient knowledge

Ensuring the patient understands how to take their medications is the primary responsibility of the dispensers. The dispensers should check the understanding of each patient by asking them to repeat the instruction.^[21] It has been suggested increasing patient knowledge of drug therapy improves compliance and may reduce adverse drug reactions . ^[29]

In this study, patient knowledge was found to be 99.9% which might have been attributed to good pharmacy staff or physicians instructions or counseling to the respondents. This might be explained by the following reasons. First, 84.9% had more than one visit to the pharmacies. Secondly, probably most patients were on chronic disease management since the most prescribed drugs were cardiovascular, while endocrine drugs were the third most prescribed. Thirdly, the prevalence of respondents with informal education and primary education was low in this study, 2.3% and 20.7% respectively. Lastly, the prevalence of respondents aged more than 60 years was low at 8.1%.

Some studies reported higher rates of misunderstanding of instructions on prescription medication labels among respondents with low literacy. ^[20] This was in contrast to this study in that 2.3% respondents in our study population had informal education and 20.7% had primary education. The high prevalence of patients' knowledge in this case might have been resulted from both physicians and pharmacy staff good counseling or instructions to respondents.

Previous studies suggested that misunderstanding instructions on prescription medication labels is more common among elderly persons.^[22] Only 8.1% of respondents in our sample were older than 60 years, and it is possible that we underestimated this relationship.

This was in contrast to the WHO / INRUD indicator studies in 12 developing countries in which patients were assessed on their knowledge on how to take drugs, between 27% and 83% knew how and when to take their drugs. In an Eritrean study nation-wide survey in 1999 an average of 80% of patients knew how to take their medication or had adequate knowledge.^[29]

In a study done in USA, it was found that correct understanding of labels ranged from 67.1% to 91.1%.^[20] The above studies show varying levels of patient knowledge which could have arisen from poor patient understanding or poor quality of the directions given by the dispensers.

4.1.3. Prescription patterns and drug availability

A prescription by a doctor may be taken as a reflection of physicians' attitude to the disease and the role of drug in its treatment. It also provides an insight into the nature of the health care delivery system. An average number of drugs per prescription (in a prescription audit) is an important index of the scope for review and educational interventions in prescribing practices.^[35]

In this study a total of 1137 drugs were prescribed for 392 patients giving an average of 2.9 drugs per prescription out of which 2 drugs were being dispensed from the facility during the study period. This was similar to a study conducted in Mumbai India that also reported the average number of drugs per prescriptions to be 2.9.^[28]

An abstract of a Nigerian study reported the mean number of drugs per prescription in a health facility to be 3.99.^[27] Similarly, hospital-based studies have reported 3-5 drugs per prescription while studies carried out in Ethiopia primary health care centres showed a mean of 2.1 which is not significantly different from the mean obtained in the present study.^[25] In a South African study 1.9 drugs were prescribed in private surgeries compared to 3 in public hospitals^[26]. Lastly, a Pakistan study reported 2.7 drugs per prescription.^[23]

However, this present study and the above studies reported slightly more drugs per prescription than that recommended by the WHO / International network for rational use of drugs (INRUD) which should be 1.6 per patient per encounter.^[26] This showed that polypharmacy was practiced thus increasing chances of adverse drug reactions, interactions, high medication costs and compliance may be also affected. In most cases it is difficult to keep the mean number of drugs per prescriptions below two, but higher figures always ought to be justified.^[25]

a. Availability of drugs

Drug availability remains a major problem in developing countries.^[27] In this study only 45.4% of the respondents got all their prescribed medication in the pharmacy. This was slightly higher than that reported in developing countries, perhaps because the study was conducted in a national referral hospital. This was almost similar to a Nigerian study conducted in secondary health centre which had 40% of prescription having all drugs prescribed available in the health facility.^[27] This was in contrast to an Eritrean study the percentage of drugs dispensed was 89%^[29]

A Ugandan study suggested that availability of essential drugs in public health facilities was improved by removal of cost sharing policies and procedures.^[32] However, this was not formally assessed in this study.

In this study, some of the drugs were not dispensed at all such as hydrochlorthiazide was among them ,others were less dispensed compared to their frequency of prescriptions and these were spironolactone, atorvastatin, budesonide inhalers, coartem, esomeprazole, tramadol and methotrexate and yet physicians had recommended one or more of these drugs to treat or extend patient's life because of their therapeutic benefits. In this study patients were able to pay for these drugs but still found it impossible to access them since they were not stocked probably during the study time.

The low availability of medicines at public hospitals like KNH therefore could have direct implications on access, as patients are then forced to buy these medicines from private pharmacies and due to nonavailability of some of these drugs, many patients had to dig deep into their pockets to pay for some the medicines which were not available. The better availability of drugs in the public sector would put pressure on private sector to lower drug prices.^[31] Since patients pay for drugs purchased there is no reason why these drugs should not be readily available for the patients. The health system needs to overhaul drug procurement system at Kenyatta national hospital and Interventions to rectify the problem of drug availability is essential to further improve rational drug use.

Previous studies reported that the over-centralized drug procurement in public health facilities particularly those run by State governments with its bureaucracy often affect drug availability in the health facilities.^[27]

b. Prevalence of prescribing

The prevalence of prescribing is the total number of prescriptions for a particular drug/drug category and also as the prescribing frequency. Prescribing prevalence studies are useful to determine the prevailing morbidity patterns.^[32]

In this study, cardiovascular drugs had a high prescribing frequency (31%) which could imply a high index of cardiovascular conditions (hypertension, hyperlipidemias, congestive heart failure and arrhythmias) in patient seeking treatment at KNH. However, this may need confirmation with the Medical records department of KNH. A study done in Manipal teaching hospital, western Nepal reported a high prescribing frequency of the antihypertensives such as amlodipine, enalapril and low dose aspirin which reflected a high prevalence of cardiovascular diseases among the study population.^[32]

In the developing countries, bacterial infections account for much of the morbidity and mortality. This is to be expected as most of the population in the developing countries exists under conditions of poverty, inadequate medical care, poor sanitation and nutrition.^[32] In this study anti-infectives had the second highest prescribing frequency (18%), this might imply either a high index of infectious diseases within the community or empirical prescribing irrespective of the availability of microbial laboratory tests.^[25] Although the WHO / International network for rational use of drugs (INRUD)^[26] study recommends the antibiotics per case should not exceed 20%, this study did not formally assess this parameter, it only accessed the number of anti-infective prescriptions and their dispensed frequency (Table 12). This study was similar to a study in Pokhara, Nepal in 2001 that reported also anti-infective to be second prescribed drugs among the five most prescribed, their order of five most prescribed drugs in descending order was antiulcer drugs, anti-infectives, antiasthma drugs, antihypertensives and analgesics. The excessive use of antimicrobials is similar to the reports from other developing countries.^[35]

This was in contrast to a study by Karimi et al in 2004, that suggested anti-infective drugs had the highest prescribing frequency, antibiotic (20.5%) and antiprotozoals (5.18%). This was followed by analgesics and skeletal muscle relaxants (2.1%). Respiratory drugs were the third most prescribed (16.6%).^[25]

Endocrine system drugs were third among the most prescribed drugs (14.2%) indicating the presence of diabetics mellitus, thyroid disorders and sexual disorders among other endocrine disorders. This showed a high prevalence of endocrine disorders among the study population. Consistent with the literature, a south African study on high prevalence prescribing of oral antidiabetic drugs which 67.4% of all antidiabetic products prescribed and biphasic insulin were found to be associated with the presence diabetes among the study population.^[33] In this study antidiabetic drugs accounted for 89.2% of all endocrine system drugs prescribed. This confirms therefore the high prevalence of diabetic mellitus patients in the study population.

Previous study in Nepal Teaching hospital reported the prescribing frequency of individual drugs as omeprazole was the most commonly prescribed antiulcer drug, amoxicillin, beclomethasone

and amlodipine were the most commonly prescribed antibiotics, antiasthma drugs and antihypertensives respectively. In this study omeprazole was also the most commonly prescribed antiulcer drug, augmentin, Salbutamol, enalapril were the most commonly prescribed antibiotics, antiasthma drugs and antihypertensives respectively hence this indicates that the prevailing morbidity patterns were almost similar only difference were the drugs prescribed. [³⁵]

In this study four pharmacies were used as representative to avoid bias and these were Pharmacy 15, staff pharmacy, paediatric pharmacy and casualty pharmacy due their big number of attendees per day. It was evident that Pharmacy 15 handled majority of the cardiovascular and endocrine prescriptions specifically antidiabetics, followed by staff pharmacy. The reasons for this probably were that patients who attended both diabetic and cardiovascular clinics had either one or both conditions and this is also explained by the age distribution in this study where by 38.3% of respondents age were above 40years which is the high risk age of having either cardiovascular or type II diabetes mellitus or both. After clinics these patients were referred to pharmacy 15 if they were not staff.

The high frequency of anti-infective, respiratory prescriptions was found with Pediatric and casualty pharmacies in descending order. In this case the children are prone to infections, and allergies due to their play ground and most especially in developing countries. Also patients who were received in casualty pharmacy were either having infectious, allergic conditions or patients who had involved in motor accidents where by antibiotics had to be used to cover up microbial infections. This parameter was not formally assessed.

However if this study would have been involved either of the specialized pharmacies such as comprehensive care centre pharmacy the prevalence of prescribing would have been different as antiretroviral drugs would have been dominated in this pharmacy due to the fact that Kenyatta national hospital HIV/AIDS outpatients are specifically handled there.

4.1.4. Patient satisfaction level

The overall satisfaction level of the patients in this study was 78.6%. This percentage was almost similar to that reported in Trinidad and Tobago (74 %). However, it was higher than that reported in rural Bangladesh 68% and in Eastern Ethiopia 54.1%.^[44]

It has been reported that some patient opinions, beliefs and suggestions may be wrong themselves or that some patients may not be telling the truth as has been reported in some studies, the successful health administrator and planner should also deal with the consumers prejudices and not only with the providers views. ^[41]

Previous studies showed that less educated patients were much more satisfied than the more educated. ^[41] In contrast, a study in Riyadh , Saud Arabia showed that educated patients are more satisfied. ^[41] In this study there was no association observed between the level of satisfaction and the type of respondents, education, age, gender, marital status, employment and number of visits. This was in line with a study conducted in eastern Ethiopia that also reported no relationship between level of satisfaction and age, educational status or consultation time. ^[44]

However, a Nigerian study also reported that patients of post secondary education are not likely to be easily impressed and are more likely to be critical and impatient than patients of lower educational levels. It has been reported that some similarities exist between results obtained for educational level, occupation and age. This may be due to the fact that in the group of post-secondary education level they were more likely to be either students or civil servants and within the age group 20 and 40 years. These groups of patients are likely to be in haste due to their occupation (students and civil servants) because they may have to get back to their various places of work while most traders (because they are self employed) are less likely to be in a hurry. ^[37]

There were contrasting data on the association of patient satisfaction level and sociodemographic characteristics of respondents. An abstract on satisfaction of Ethiopian outpatients reported that age was associated with dissatisfaction. ^[38] However, another Eastern Ethiopia study reported no significant association based on age, educational status and consultation time. ^[44]

This was also in line with a Nigerian study that suggested the sociodemographic characteristics of respondents were not associated with their level of satisfaction.^[37] Although the respondents complained of long consultation time, it was not formally assessed by this study.

Previous studies have reported the level of satisfaction to be related to the payment status, paying patients are less satisfied than non-paying patients with the overall quality of the service.^[45]

This may be related to the fact that their expectation of the service may rise when they incur certain costs to the service.^[45] Although respondents complained of payment procedures for medication, it was not formally assessed by this study.

In this study, 86% of respondents were pleased with the promptness of the prescription drug services. However, average waiting time for drug services was not assessed which has been shown to be related to the patient level of satisfaction.^[37] Dispensing time was also not assessed, which might also have affected patient satisfaction levels.

In this study there was no significant difference in the level of satisfaction and gender of the respondents. This was in contrast to previous studies that have reported that female respondents tended to experience satisfaction with most of the pharmaceutical services than their male counterparts.^[37, 41] The trend of more female satisfaction than males was likely to be the result of the more courtesy that is naturally given to females than males.^[41] Also females tend to appreciate more services given to them than males. Lastly, females were generally more likely to be patient and less in haste than males.^[37] This corresponds to a similar study which was conducted in teaching hospitals, Riyadh, Saudi Arabia which also reported most satisfaction with females however the Saudi study the females satisfaction was due to more courtesy that is naturally given to females and also that pharmacy staff act in consonance with Saudi cultural etiquette that tends to treat women respectfully than men in various public and social circumstances^[41]

In this study only 45.4% of the respondents got all their prescribed medication in the pharmacy. An abstract of Ethiopian study on satisfaction with outpatient services in hospitals of Amhara region associated failure to find prescribed medication in the pharmacy with dissatisfaction.^[37]

In this study, the results suggested that the respondents were 74% pleased with the amount of time the pharmacy staff spent with them. This was in contrast with a Nigerian study where 46% of respondents regarded the amount of time the pharmacist/Pharmacy staff spent with them as poor.^[37]

Patient information and counseling services have been also associated with patient satisfaction level.^[41] However, this study did not assess these parameters.

4.2. CONCLUSIONS

- i. Overall, labelling met the majority of the prescription labelling requirements, since most items were present on more than half of labels. It may be argued, however, that a higher standard should be applied for the sake of patient safety.
- ii. There was satisfactory patient knowledge.
- iii. The average number of drugs per prescription was 2.9 during the study period. However, this was above the WHO recommendation of 1.6 drugs per patient per encounter.
- iv. The most prescribed drugs were for the cardiovascular system, anti-infectives and endocrine system.
- v. The most commonly prescribed individual drugs in different groups were enalapril, augmentin(amoxicillin & clavulanate K), salbutamol, cetirizine and omeprazole.
- vi. Only 45.4% of the respondents got all their prescribed medication in the pharmacy.
- vii. The level of patient satisfaction was generally higher than that reported in other developing countries.
- viii. There was no association observed between the level of satisfaction and the type of respondents with regard to age, gender, marital status, education, employment and number of visits.

4.3. RECOMMENDATIONS AND FUTURE WORK

- i. Prescriber's number, name and address of the pharmacy should be in use in case of any problem occurring during medication use.
- ii. Advocacy for fewer drugs per prescription based on correct diagnosis.
- iii. Better availability of drugs should be checked based on better targeting of existing spending for medicines on priority or by increasing the public budget for essential medicines.
- iv. Future studies should formally assess patient consultation time, waiting time and dispensing time.
- v. Studies should be conducted in other public hospitals to establish the appropriateness of labelling practices , patient knowledge, the level of patient satisfaction
- vi. The impact of hospital multi-discipline services should also be assessed on patient satisfaction.

4.4. LIMITATIONS OF THE STUDY

- i. Study was limited to English and Kiswahili speaking respondents.
- ii. Respondents were sampled from KNH only; therefore findings may not be applicable to other public hospitals.
- iii. Insufficient funds and time.
- iv. The impact of consultation time, waiting time, and payment status and payment procedures on patient satisfaction levels were not assessed.
- v. The style and language of labelling was not formally assessed.
- vi. The outpatient pharmacy which dispenses ARVs(C.C.C.Pharmacy) was not surveyed due to limited time.
- vii. Essential drug list was not formally assessed
- viii. Affordability, drug prices and price components were not formally assessed.

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APPENDICES

Appendix I: Work Plan

Tasks to be Performed	Time	Personnel
Proposal writing	Feb – March, 2008	Principal investigator(PI)
Submit proposal to KNH Ethics & Research committee	March, 2008	PI
Make adjustments proposed by the KNH Ethics & research committee	April, 2008	PI
Data Collection	May, June & July 2008	PI and Assistant
Data Analysis and write up of the final copy.	Aug, Sept & Oct 2008	PI and Analyst
Defense of Dissertation	November, 2008	PI

Appendix II : Budget for the Research Works

ITEM	DESCRIPTION	UNITS	@ (KSHS)	COSTS (KSHS)
Literature net search	Time spent in Cyber cafes for literature research	100 hrs	60/Hr	6000
Proposal Development	Typing ,Printing, Photocopying, and binding of several drafts	20	500/Draft	10000
Printing Costs	Data collection forms, Consent forms and Sampling forms and Final document copies	1000	10/printed paper	10000
Photocopying	Data collection forms, final Document	1000	3/each paper	3000
Binding	Proposal, final Document	30	50/ each	1500
Research assistant	Assisting in collection of the data.	3months	15000/Month	45000
Analyst of the data	Data analysis using a computer data analysis software.	-	-	22000
Contingency (10%)	-	-	-	9750
TOTAL				107250

The budget will be financed by CTB/BTC Channel 3/ Ministry of Health-Rwanda.

Appendix III: Informed Consent

I am **Dr. NYILIGIRA John**, a final year student in masters of Clinical pharmacy In the department of pharmaceutics and pharmacy practice, School of Pharmacy, College of Health Sciences and University of Nairobi. The purpose of this study is to assess dispensing practices and Patients satisfaction with Pharmaceutical services.

The Procedure of this study will involve filling in a standard questionnaire, interviews, observation of labels and filling in a standard reporting form.

This study will benefit you by identifying areas in pharmaceutical services which need improvement and will also lay a basis for future treatment success policies that may benefit you and other patients who are using same pharmaceutical services.

There will be no risks at all involved, since there will be no invasive procedures and you will not be actively participating in the study.

Participation is voluntary. Your identity and results of the study will be kept confidential.

I..... hereby consent to participate in the proposed research study on **“Assessment of Dispensing Practices and Patients’ Satisfaction with Pharmaceutical Services at Kenyatta National Hospital Pharmacies”**.

As explained to me, the nature of the study will involve filling in standard questionnaire, interviews and observation of drug labels on dispensed drugs and then fill in a standard reporting form . While significant findings that may improve pharmaceutical services to the clients will be kept strictly confidential.

I understand that I am free to withdraw from the study at any time without forfeiting any pharmaceutical benefits due to me.

Signature of the participant /Next of kin.

Date

.....

.....

Signature of the Principal investigator

.....

.....

Any question regarding the study may be forwarded to:

The Principal investigator: Tel. 0728248721

Head of KNH Ethical committee: Tel. 020-726300

Appendix IV: Data Collection Form (Questionnaire)

STUDY NO.....

PATIENTS PERSONAL DATA

Status of Respondent

- Patient
- Parent/Guardian
- Age.....

Gender

- Male
- Female

Marital status

- Single
- Married

Education

- Informal
- Primary
- Secondary
- College/University+

Employment status

- Employed
- Self employed
- Unemployed

Number of Visits.....

A. PRESCRIPTION SERVICE QUESTIONS:

1) Do you feel that you were served promptly in this pharmacy, given the number of people being served during the time you were there?

Yes No

2) Did you get all medications prescribed for you in this pharmacy ?

Yes No

B. MEDICATION THERAPY MANAGEMENT AND INTERACTIONS:

3) Did the pharmacist/Pharmacy staff give you instructions about how to take your medications before you left the counter?

Yes No

4) Was the amount of time the pharmacist/Pharmacy staff offered to spend with you explaining how to take your medications adequate for you to understand well?

Yes No

5) Did you ask the pharmacy staff any question?

Yes No

6) If yes, were you satisfied with the answer?

Yes No

7) Were you impressed by the way you were handled by the pharmacy Personnel?

Yes No

8) Was the pharmacy staff who served you putting on a white apron with his/her name plate (Identification) ?

Yes No

9) Are you comfortable with the environmental appearance of this pharmacy ?

Yes No

C. Overall Pharmacy Service Experience

10) Are you satisfied with the services you received at this pharmacy on your visit ?

1.Dissatisfied 2.Neutral 3.Satisfied

Appendix V: A standard reporting form → Ref.46 & 47

NO	Prescribed drugs	Dispensed drugs		Product brand name or Generic name		The quantity of drugs		Directions for use		Patient name		Date of dispensing / filling		Name & address of the pharmacy		Keep out of reach of children		Prescription Number		Prescriber's name		Expiry Date		Cautionary Statements		Patient knows how to take the drugs		
		YES	NO	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	YES
1																												
2																												
3																												
4																												
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13																												
14																												
15																												

KEY

P = Present
A = Absent

Appendix VI: KNH Ethics & Research Committee Approval



KENYATTA NATIONAL HOSPITAL
Hospital Rd. along Ngong Rd
P.O. Box 20723, Nairobi
Tel. 2726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi.
Email: knhadmin@knh.or.ke

Ref: KNH-ERC/ 01/ 330

14th April, 2008

Dr. Nyligira John
Dept. of Pharmaceutics and Pharmacy Practice
School of Pharmacy
UNIVERSITY OF NAIROBI

Dear Dr. Nyligira

RESEARCH PROPOSAL: "ASSESSMENT OF DISPENSING PRACTICES AND PATIENTS SATISFACTION WITH PHARMACEUTICAL SERVICES OFFERED AT KNH PHARMACIES" (P48/3/2008)

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and approved your above cited research proposal for the period 14th April, 2008 – 13th April, 2009.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimen must also be obtained from KNH-ERC for each batch.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely


PROF A N GUANTAI
SECRETARY, KNH-ERC

c.c. Prof. K.M. Bhatt, Chairperson, KNH-ERC
The Deputy Director CS, KNH
The Dean, School of Pharmacy, UON
Supervisor Dr. David Scott, Dept. of Pharmaceutics and Pharmacy Practice, UoN

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