

**ASSESSMENT OF HEALTH WORKERS' ADHERENCE TO STANDARD
TREATMENT GUIDELINES IN MANAGEMENT OF TYPHOID
FEVER AT KAMPALA INTERNATIONAL UNIVERSITY
TEACHING HOSPITAL.**

BY

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**A RESEARCH SUBMITTED TO SCHOOL OF PHARMACY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
DEGREE OF BACHELOR OF PHARMACY AT
KAMPALA INTERNATIONAL UNIVERSITY**

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DECLARATION

I Katusiime Judith, hereby declare that this research proposal is my original work and has not been previously presented for an academic award in any other University

Signature: 

Date. 18/12/2018.

KATUSIIME JUDITH

CERTIFICATION

This research proposal titled "Assessment of health workers' adherence to standard treatment guidelines in management of Typhoid fever at Kampala International University- Teaching Hospital" has been prepared under my guidance and supervision. It is now ready for submission to the School of Pharmacy of Kampala International University-Western campus.

Sign.......... Date18/12/2018.....

MR. ROBERT KABANZA

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LIST OF ABBREVIATIONS

WHO	World health organization
UCG	Uganda clinical guidelines
KIU-TH	Kampala International University Teaching Hospital
WAT	widal agglutination test.
RDT	random diagnostic test
HC3	Health Centre 3
HC4	Health Centre 4
SPSS	Statistical package for social science
Kg	kilograms
Mg	Milli-grams

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ABSTRACT

Typhoid fever remains a global health problem and it is difficult to estimate the real burden of typhoid fever in the world because the clinical picture is confused with many other febrile infections. Thus this study was aimed assessing health workers' adherence to standard treatment guidelines in the management of typhoid fever in KIU-TH.

A retrospective study design was used which was quantitative in nature involving obtaining data from patient files. The study population were patients with typhoid fever attending at KIU-TH and a sample size 60 patients' files was used. Data was collected with help of the data sheet and entered into SPSS version 25, analyzed and presented in form of tables, graphs and pie-charts.

The most commonly used medicine to treat typhoid fever was Ciprofloxacin tabs used in 34(56.7%) of the cases in files and the mostly used test for typhoid fever was WAT used in 31(51.7%) files used in this study and 29(48.3%) file cases RDT was used to test for typhoid fever. All cases that used Azithromycin tabs the prescribed dose was 500mg of which 2 cases their dose duration was 3 days and 3 used the dose duration of 5 days. Similarly all the cases where Ciprofloxacin tabs 500mg was the dose, where 26 cases used 10 days as the dose duration and 7 used 14 days as the dose duration. Whereas for Amoxicillin capsules 11 case files used a dose of 500mg and 5 used a dose 1g, 6 cases used a dose duration of 5 days, 8 used a dose duration of 10 days and lastly 2 used a dose duration of 14 days. 3 cases that used Cefixine capsules used 1g as their dose and 2 used 400mg as their dose, 4 used dose duration of 5 days and only 1 used a dose duration of 7 days.

In conclusion, all medicines used by health workers that is Ciprofloxacin tablets, Amoxicillin capsules, Azithromycin tablets and Cefixine were recommended by WHO guidelines and UCG. The mostly used medicines was Ciprofloxacin tabs and Ciprofloxacin tablets was properly prescribed by mainly following UCG. Though tests used in diagnosis of typhoid fever that is WAT and RDT were neither recommended by WHO guidelines nor UCG. Regarding doses, all Azithromycin tabs doses were correctly prescribed though 80% of the dose durations were not correct, Cefixine capsule was properly prescribed though 80% of durations were wrong, Amoxicillin capsules doses was properly prescribed using UCG though 43.8% dose durations were wrong according UCG.

CHAPTER ONE: Introduction

1.1 Background.

Typhoid fever is caused by *Salmonella typhi*, a Gram-negative bacterium and remains a global health problem. It is difficult to estimate the real burden of typhoid fever in the world because the clinical picture is confused with many other febrile infections, and the disease is underestimated because of the lack of laboratory resources in most areas in developing countries. As a result, many cases remain under-diagnosed (WHO, 2011). Besides that Typhoid fever has been estimated to cause between 9.9 and 24.2 million cases and 75000-208000 deaths per year (Antillon et al., 2017). The WHO (2018) estimates that 11 -20 million people suffer from the disease, and amongst these 128,000 and 161,000 die each year, also people from poor communities and vulnerable groups (children included) have been noted to be at the greatest risk due to Typhoid fever. Typhoid fever usually presents with protracted high grade fever, and characteristically a normal to low white blood cell and platelet count. The most common complication in typhoid fever is intestinal bleeding (Jong et al., 2018)

In spite of the fact that there is improvement in hygiene, food processing, education of food handlers and information to consumers, food borne diseases still dominate as the most significant public health problem in many countries (Dominguez et al., 2002). Apart from the food borne infections, the other major epidemiological development in salmonellosis is the emergence of resistant *Salmonella typhi* particularly in the developed countries (Khumalo et al., 2014).

Typhoid fever prevalence does not seem to decrease in spite of the availability of antibiotics and vaccines in the market due to emergence of antibiotic resistant strains of the pathogenic organisms, the disease management is becoming difficult and more challenging to countries with no standard specific guidelines such as India (Upadhyay et al., 2015). National guidelines have been observed to have a great impact on health management of typhoid fever through reducing its transmission. The guidelines also promote reduced cost to patients, healthcare professionals, laboratories and environmental health officers (Russell et al., 2018). WHO (2011) recommends countries to carry out programmatic use of Typhoid vaccines in order to control Typhoid fever especially in school-age and preschool age children in areas where typhoid fever is a public

health problem. This is especially so necessary where antibiotic resistant *salmonella typhi* is prevalent and in out- breaks. Efficient vaccination programs against typhoid fever can also be cost saving to health services in countries where the disease is endemic especially when targeted to the most seriously affected age groups (Watson et al., 2015)

1.2 Problem statement

Improper usage of antibiotics contributes to the emergence of antibiotic resistance. It has been noted that irrational prescribing of antibiotics leads to resistant strains of *Salmonella typhi* and relapses of typhoid fever. A previous study analyzing prescriptions revealed that some patients were given inappropriate drugs. This could be as result of non-adherence to the National guidelines for management of typhoid fever. Further, parts of prescriptions were incomplete as well as therapeutic duplication occurrences. Polypharmacy , drug-drug interactions, patient non-compliance was also found out in some patients(Sana et al.,2017).The association between increased rates of antimicrobial use and resistance was also documented for nosocomial infections as well as for resistant community acquired infections (Frieden,2013).

In recent times, an epidemiological outbreak of Typhoid in Kasese and Bundibugyo of Uganda caused the spread of multi drug resistant strains of *Salmonella typhi* among the residents (Walters et al.,2014). Therefore considering the increased incidences of typhoid fever and emergence of multi-drug resistant *salmonella typhi* at global levels, this study has been proposed to assess health workers' adherence to standard treatment guidelines in management of typhoid fever at Kampala international university teaching hospital.

1.3 General objective

To assess health workers' adherence to standard treatment guidelines in the management of typhoid fever in Kampala International University -Teaching Hospital.

1.4 Specific objectives

- To identify medicines used in management of typhoid fever.

- To establish tests done during diagnosis of typhoid fever.
- To identify doses and dosage duration of medicines prescribed.

1.5 Research questions.

- Do health workers use appropriate medicines in management of typhoid fever?
- Are medicines prescribed at appropriate titers during typhoid fever treatment?
- Are appropriate doses and dosage duration of medicines prescribed in management of typhoid fever?

1.6 Justification of the proposed study

There has been recent reports of large scale emergence and spread of extensively drug resistant strain of *Salmonella typhi* (Klemm et al., 2018), which helped to highlight the need of proper adherence to national guidelines for treatment of typhoid fever. Resistance of salmonella to the commonly used antibiotics makes the treatment of typhoid fever a complicated task (Pacifci, 2018). Typhoid fever can be appropriately managed with the use of drugs such as flouroquinolones, cephalosporin and Azithromycin although indiscriminate use of antibiotics has increased its resistance (Upadhyay et al., 2015)

Therefore, it is necessary to assess health workers' adherence to standard treatment guidelines in management of typhoid fever in Kampala International University teaching hospital.

1.7 Significance of the study

The findings of this study would help improve health workers prescribing practices in management of typhoid fever. As for the findings, they might help improve the cure rate of typhoid fever, help in reduction of relapses of typhoid fever and might also help reduce high expenses incurred in treating typhoid fever.

CHAPTER TWO: Literature review

2.1 Medicines recommended by WHO in management of typhoid fever

WHO (2011) recommends the below guidelines in management of typhoid fever both in children and adults

Table 1: WHO recommendations in management of typhoid fever

Optimal therapy				alternative effective drugs		
Susceptibility	Antibiotic	Daily dose mg/kg	Days	Antibiotic	Daily dose mg/kg	Days
Mild disease						
Fully sensitive	Ciprofloxacin or Ofloxacin	15	5-7	Chloramphenical	50-75	14-21
				amoxicillin	75-100	14
				Cotrimoxazole	8-40	14
Multi drug resistant	As above or cefixime	15	7-14	Azithromycin	8-10	7
		15-20	7-14	Cefixime	15-20	7-14
Quinolone resistance	Azithromycin	8-10	7	Cefixime	20	7-14
	Rocephin	75	10-14			
Severe illness						
Fully sensitive	Ciprofloxacin or Ofloxacin	15	10-14	Chloramphenicol	100	14-21
				amoxicillin	100	14
				cotrimoxazole	8-40	14
Multi drug resistant	As above or cefixime	15	10-14	Rocephine,	75	10-14
		15-20	10-14	cefotaxime	80	10-14
Quinolone resistance	Rocephine,	75	10-14	fluroquinolone	20	7-14
	cefotaxime,	80	10-14			
	azythromycin	8-10	10-14			

Tests recommended by WHO during diagnosis of typhoid fever. The definitive diagnosis of typhoid fever depends on the isolation of *s.typhi* organisms from the blood or bone marrow or

stool although the widal test measuring agglutination antibody titers against *s.typhi* in serum has only moderate sensitivity and specificity. It can be negative in up to 30% of culture proven cases of typhoid fever and can be falsely positive in many circumstances. (WHO, 2011)

2.2 Uganda clinical guidelines on management of typhoid fever.

UCG (2016) recommends the below guidelines in Management And treatment of typhoid fever in both children and adults in Uganda

Table 2: Uganda clinical guidelines in management of typhoid fever.

TREATMENT	LOCATION
Ciprofloxacin 500mg every 12 hours for 10-14days Child 10-15mg/kg per dose Otherantibiotics	HC3
Chloramphenicol 500mg 6 hourly for 10 days Child:25mg/kg per dose In severe, resistant forms or pregnancy	HC3
Ceftriaxone 1g IV every 12 hours for 10-14 days Child :50mg per dose Alternative in pregnancy	HC4
Amoxicillin 1g every 8 hours for 10 days Child:10-15mg/kg per dose Chronic carriers(treat for 4-6 weeks)	
ciprofloxacin 500-750mg every 12 hours child:10-15mg/kg per dose	HC3
Refer complications (forexample perforation) to a higher level of care	Hospital

Ugandan guidelines on diagnosis of typhoid fever. Uganda clinical guideline, 2016 recommends the following investigations while diagnosing typhoid fever; Blood culture (most reliable), Stool

culture, Rapid antibody test-not very sensitive but it can be used in epidemics. Proportion of health workers who are compliant to typhoid fever treatment guidelines.

During a study analysis, it was revealed that only 16% prescribers followed clinical guidelines by WHO while prescribing and 84% prescribers did not follow any standard treatment guidelines for management of typhoid fever, 70% patients were not provided with appropriate information about disease and treatment therapy while only 30% patients were provided with appropriate information (Sana et al., 2017).

2.3 Health worker factors influencing compliance to typhoid fever treatment guidelines

Proper clinical information, diagnosis and clear understanding of the epidemiology of typhoid fever are paramount to the effective control disease of the disease. It also requires the engagement of healthcare institutions both in the private and public sectors to facilitate surveillance and control measures for the disease. The existence of Standard Treatment Guidelines does not guarantee their being used in practice (Feder et al.,1999).some studies have found out that people generally resist a change in their work place(Curtis and white 2002),and this resistance can be a contributing factor that makes health workers fail to follow typhoid fever treatment guidelines(cabana et al.,1999)

There are identified barriers to health workers compliance to treatment guidelines and are categorized as the following: lack of awareness, lack of familiarity, lack of agreement with guidelines ,lack of self-efficacy, lack of outcome expectancy, lack of motivation and external factors(Cabana et al.,1999).

Consequences of non-compliance to standard treatment guidelines

Health outcomes and costs are related to treatment guidelines compliance. Patients treated according to guidelines show increase in treatment effectiveness and reduced treatment costs (Quaglini et al., 2004)

Noncompliance leads to increased drug resistant typhoid fever, prolonged hospital stays, as well as morbidity and mortality associated with the disease (Upadhyay et al., 2015).

CHAPTER THREE: Methodology

3.1 Introduction

This chapter describes where the study was carried out and the methods that were utilized. Included in this chapter are descriptions of the study settings, study design. It also gives an explanation of how data collection, data analysis will be carried out and addresses ethical considerations related to the study.

3.2 Study design

A retrospective study was used which is quantitative in nature involving obtaining data from patient files.

3.3 Study setting

This study was conducted from KIU-Teaching Hospital which is located in Bushenyi District, south western Uganda from June 2018 to November 2018.

The hospital is located along the Mbarara-Kasese high way. It is approximately 306km from Kampala, the capital city of Uganda

3.4 Study population

The study population were patients with typhoid fever attending at KIU-TH

3.5 Inclusion and exclusion criteria

3.5.1 Inclusion criteria

Patient information of those suffering from only typhoid in outpatient department

3.5.2 Exclusion Criteria

Patient information of those suffering from both typhoid fever and any other bacterial infection at the same time.

Patient information of those suffering from typhoid fever in inpatient department.

3.6 Sample size

KIU-TH outpatient department receives about 100 patients with typhoid fever in a month of which like only 30% can be having typhoid fever alone. Thus considering 4 months a population of 400 patients' files was considered in this study. The sample was determined using Kish and Leslie formula (1965) that was simplified by Yamane (1967) as shown below.

$$\text{From } N = \frac{(PQ)Z^2}{D^2} \quad \text{to} \quad N = \frac{n}{1+nD^2}$$

Where:

n is the population to be used (260)

N is the sample size required

Z^2 is the abscissa of the normal curve that cuts off an area at the tails ($1-\alpha$ equals the desired confidence level, e.g., 95%),

P is the estimated proportion of an attribute that is present in the population

D is the desired level of precision (0.05)

Q is 1-P

$$N = \frac{400}{1+(400)0.05^2} = 200$$

$$\text{Taking 25\% gives } \frac{30}{100} \times 200 = 60$$

Therefore the study used a sample size 60 patients' files.

3.7 Sampling techniques

File records for months (April, May, June and July) 2018 were used in this study. Of these files, only files that presented management of typhoid fever alone were selected and used in this study.

3.8 Data analysis procedures

Data will be analyzed using SPSS statistical package. Analysis of variance, correlation analysis will be performed on the corrected data.

The details on the questionnaires will be tallied and entered into both tubular and graphic presentations (Bar graphs, circles and pie charts will be created using Microsoft Excel) which will be used to illustrate the quantitative data.

Data will be analyzed using the SPSS statistical package, version 16 for comparison of quantitative data. This will compute my results in percentages which will be in relation to adherence of health workers to standard treatment guidelines in management of Typhoid fever at KIU-Teaching Hospital.

3.9 Ethical considerations

Permission will be sought from the school of pharmacy and KIU research Ethics committee to conduct the research

Anonymity and confidentiality will be ensured.

3.10 Limitations to the study

The research will be carried out in one hospital and findings obtained may not therefore be used to generalize for all hospitals country wide

CHAPTER FOUR: Data presentation

4.0 Introduction

This chapter presents the findings of the results from the 60 patients' files on management of typhoid fever at KIU-TH. The findings were presented in line with the study objectives.

4.1 Social demographic findings

Of the 60 files used in this study, majority 35(58.3%) were for females and 25(41.7%) were for males. Majority 20(33.3%) were aged 20-30 years. Many 46(76.7%) cases were for adults and only 14(23.3%) cases were for children.

Table 3: table showing social demographic finding of used cases

	Frequency (n)	Percentages (%)
Sex of respondents		
Male	35	58.3
Females	25	41.7
Age of respondents		
1-15 years	16	26.7
16-20 years	15	25.0
21-30 years	20	33.3
31-40 years	4	6.7
41-50 years	3	5.0
Above 60 years	2	3.3
Status		
Children	14	23.3
Adults	46	76.7

4.2 Medicines used in management of typhoid fever.

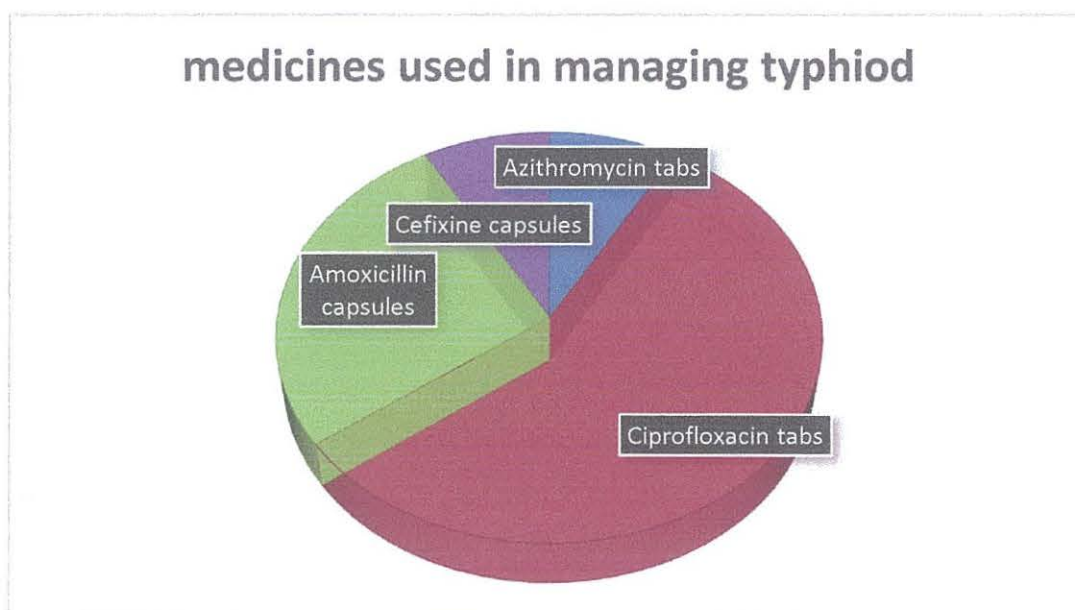
From the table below the most commonly used medicine to treat typhoid fever was Ciprofloxacin tablets used in 34(56.7%) of the cases in files, followed by Amoxicillin capsules used in 16(26.7%) of file cases, and lastly Azithromycin tablets and Cefixine capsules each was used in 5(8.3%) of the filed cases used in this study.

Table 4: table showing medicines used in treatment of typhoid fever

	Frequency (n)	Percent (%)
Azithromycin tabs	5	8.3
Ciprofloxacin tabs	34	56.7
Amoxicillin capsules	16	26.7
Cefixine capsules	5	8.3

Figure 1: pie-chart illustrating medicines used in treatment of typhoid fever

From the pie-chart below ciprofloxacin tabs were highly used medicines.



4.2.1 Comparing Medicines at KIU-TH with those UCG and WHO guidelines in management of typhoid fever

From the table below, regarding medicines used in management of typhoid, Azithromycin tablets was recommended only WHO guidelines, Ciprofloxacin tablets was recommended by both Uganda clinical guidelines and WHO guidelines, Amoxicillin capsules was recommended by both Uganda clinical guidelines and WHO guidelines while Cefixine was recommended only WHO guidelines.

		Uganda guidelines satisfaction for prescribed antibiotics		WHO guidelines satisfaction for prescribed antibiotics	
		yes	No	yes	No
antibiotic prescribed	Azithromycin tabs	0	5	5	0
	Ciprofloxacin tabs	34	0	34	0
	Amoxicillin capsules	16	0	16	0
	Cefixine capsules	0	5	5	0

4.3 Tests done during diagnosis of typhoid fever

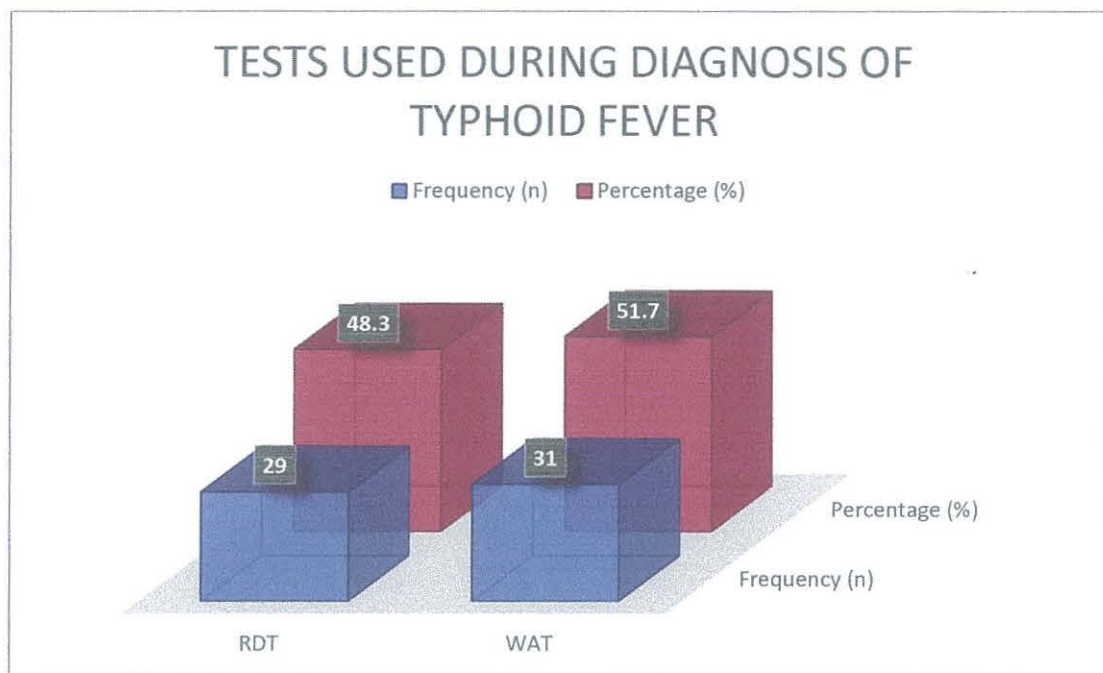
From the table below the mostly used test for typhoid fever was WAT (**w**idal agglutination test) used in 31(51.7%) files used in this study and 29(48.3%) file cases RDT (random diagnostic test) was used to test for typhoid fever.

Table 5: table illustrating tests used during diagnosis of typhoid fever

	Frequency (n)	Percentage (%)
RDT	29	48.3
WAT	31	51.7
Total	60	100.0

Figure 2: A graph illustrating the tests used in diagnosis of Typhoid fever

From the graph the mostly used test for typhoid fever was WAT used in 31(51.7%) files used in this study and 29(48.3%) file cases RDT was used to test for typhoid fever.



4. 4 Doses and dosage duration of medicines prescribed

From the table below, all cases that used Azithromycin tablets had a prescribed dose of 500mg of which 2 cases their dose duration was 3 days and 3 cases used the dose duration of 5 days. Similarly all the cases where Ciprofloxacin tablets 500mg dose was used, 26 of these cases used 10 days as the dose duration and 7 cases used 14 days as the dose duration. Whereas for Amoxicillin capsules 11 case files used a dose of 500mg and 5 used a dose 1g, 6 cases used a dose duration of 5 days, 8 used a dose duration of 10 days and lastly 2 used a dose duration of 14 days. All 5 cases that used Cefixine capsules used 400mg as their dose, 4 used dose duration of 5 days and only 1 used a dose duration of 7 days.

Table 6: table illustrating the doses and dose durations of medicines used

		dose (mg)			dose duration				
		500mg	1g	400mg	3 days	5 days	7 days	10 days	14 days
antibiotic prescribed	Azithromycin tabs	5	0	0	2	3	0	0	0
	Ciprofloxacin tabs	34	0	0	0	1	0	26	7
	Amoxicillin capsules	11	5	0	0	6	0	8	2
	Cefixine capsules	0	0	5	0	4	1	0	0

4.4.1 Comparing doses of medicines prescribed at KIU-TH with those UCG and WHO guidelines in management of typhoid fever

From the table below, all 5 Azithromycin tablets doses satisfied WHO guidelines. All 34 Ciprofloxacin tablets doses satisfied Uganda clinical guidelines (UCG), 27 Ciprofloxacin tabs doses satisfied WHO guidelines and 7 Ciprofloxacin tabs doses didn't satisfy WHO guidelines. All 16 Amoxicillin capsules doses satisfied Uganda clinical guidelines (UCG), 2 Amoxicillin capsules doses satisfied WHO guidelines and 14 Ciprofloxacin tabs doses didn't satisfy WHO guidelines. All 5 Cefixine capsules doses didn't satisfy UCG, 5 Cefixine capsules doses satisfied WHO guidelines.

Table 7: Tabling illustrating dose at KIU-TH with UCG and WHO guidelines

		satisfying dose recommended by UGG		satisfying Dose recommended by WHO	
		Yes	no	yes	No
antibiotic prescribed	Azithromycin tabs	0	5	5	0
	Ciprofloxacin tabs	34	0	27	7
	Amoxicillin capsules	16	0	2	14
	Cefixine capsules	0	5	5	0

4.4.2 Comparing dosage duration of medicines prescribed at KIU-TH with those UCG and WHO guidelines in management of typhoid fever

From the table below, only one Azithromycin tabs dose durations satisfied WHO guidelines and 4 Azithromycin tabs dose durations didn't satisfy WHO guidelines. 33 Ciprofloxacin tabs dose duration satisfied Uganda clinical guidelines (UCG) and one didn't, 33 Ciprofloxacin tabs dose durations didn't satisfy WHO guidelines and one Ciprofloxacin tabs dose durations satisfied WHO guidelines. 9 Amoxicillin capsules dose durations satisfied Uganda clinical guidelines (UCG) and 7 didn't, 2 Amoxicillin capsules dose durations satisfied WHO guidelines and 14 Ciprofloxacin tabs dose durations didn't satisfy WHO guidelines. All 5 Cefixine capsules dose durations didn't satisfy UCGs, one Cefixine capsules dose duration satisfied WHO guidelines and 4 Cefixine capsules dose durations didn't satisfy WHO guidelines.

Table 8: Table illustrating comparison of KIU-TH dose duration with UCG and WHO guidelines

		satisfying dose duration by UGG		satisfying dose duration by WHO	
		yes	no	yes	no
antibiotic prescribed	Azithromycin tabs	0	5	1	4
	Ciprofloxacin tabs	33	1	1	33
	Amoxicillin capsules	9	7	2	14
	Cefixine capsules	0	5	1	4

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The findings were discussed basing on the results as presented in the previous chapter. The findings were discussed in relation with other literature from different authors.

5.1 Discussion of the results

This study revealed that the most commonly used medicines to treat typhoid fever was Ciprofloxacin tablets and Amoxicillin capsules. This was supported by WHO guidelines, (2011) and Uganda clinical guidelines (UCG), (2016) where both Ciprofloxacin tablets and Amoxicillin capsules were recommended as medicines to use in treating typhoid fever. Further the least used medicines that is Azithromycin tabs and Cefixine capsules were not recommended UCG but were recommended by WHO guidelines only.

Regarding tests used in diagnosis of typhoid fever in this study, the mostly used test for typhoid fever was WAT (**w**idal agglutination test) used in 51.7% cases and RDT (random diagnostic test) used 48.3% cases. Though according to WHO, (2011) about 30% WAT cases could be negative on using culture therefore in many circumstances, there could be false positive. Furthermore Uganda clinical guideline, (2016) recommended Blood culture (most reliable) and Stool culture to be used in diagnosing typhoid fever. Whereas for RDT was recommended to only be used in epidemics though it is not very sensitive.

Considering drugs that were only recommended by WHO guidelines (2011), all 5 Azithromycin tablets doses were correctly prescribed by KIU-TH health workers and regarding Cefixine capsule doses, all 5 Cefixine capsule doses satisfied WHO guidelines. On use of Ciprofloxacin tablets and Amoxicillin capsules that recommended by both UCG and WHO guidelines, all Ciprofloxacin tablets doses satisfied Uganda clinical guidelines (UCG) but not all satisfied WHO guidelines that is 20.6% Ciprofloxacin tablets doses didn't satisfy WHO guidelines. Similarly all

Amoxicillin capsules doses satisfied Uganda clinical guidelines (UCG) but not all satisfied WHO guidelines that is 87.5% Amoxicillin capsules doses didn't satisfy WHO guidelines.

Considering drugs that were only recommended by WHO guidelines (2011), only one Azithromycin tablets dose duration satisfied WHO guidelines and 4 Azithromycin tablets dose durations didn't satisfy WHO guidelines. Similarly one Cefixine capsules dose duration satisfied WHO guidelines and 4 Cefixine capsules dose durations didn't satisfy WHO guidelines. On use of Ciprofloxacin tabs and Amoxicillin capsules that were recommended by both UCG and WHO guidelines 33 Ciprofloxacin tablets dose durations satisfied Uganda clinical guidelines (UCG) and one didn't, 33 Ciprofloxacin tabs dose durations didn't satisfy WHO guidelines and one Ciprofloxacin tabs dose durations satisfied WHO guidelines. 9 Amoxicillin capsules dose durations satisfied Uganda clinical guidelines (UCG) and 7 didn't, 2 Amoxicillin capsules dose durations satisfied WHO guidelines and 14 Ciprofloxacin tabs dose durations didn't satisfy WHO guidelines.

5.1 Conclusion

In conclusion, all medicines used by health workers that is Ciprofloxacin tablets, Amoxicillin capsules, Azithromycin tablets and Cefixine were recommended by WHO guidelines and Uganda clinical guidelines (UCG). The mostly used medicines was Ciprofloxacin tabs and Ciprofloxacin tablets was properly prescribed by mainly following UCG. Though tests used in diagnosis of typhoid fever that is WAT (widal agglutination test) and RDT (random diagnostic test) were neither recommended by WHO guidelines nor UCG. Regarding doses, all Azithromycin tabs doses were correctly prescribed though 80% of the dose durations were not correct, Cefixine capsule was properly prescribed though 80% of durations were wrong, Amoxicillin capsules doses was properly prescribed using UCG though 43.8% dose durations were wrong according UCG.

5.1 Recommendations

Despite the use of correct medicines in treating typhoid fever, some challenges were identified by this and therefore the research recommends the following;

- KIU-TH health workers and other health workers to adopt the tests used recommended by WHO guidelines or Uganda clinical guidelines for proper results.
- Health worker should properly understand the dose and their duration especially for those medicines described by WHO guidelines to avoid wrong prescription.
- Research, academicians, and Organizations to carry more research regarding the same topic.

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APPENDICES

APPENDIX 1: Data collection sheet

Data collection tool used in assessing health worker' adherence to standard treatment guidelines in management of typhoid fever at Kampala International at Kampala Intentional Teaching Hospital.

NOTE;

SEX- indicate **F** for female, **M** for male and **P** for pregnant females

INVESTIGATIONS- indicate **BS** for blood culture, **SC** for stool culture, **RDT** for random diagnostic test, **WAT** for **widal** agglutination test.

TYHOID FEVER CATEGORY, indicate **A** for acute typhoid, **C** for chronic carriers, **U** for uncategorized typhoid fever.

ANTIBIOTICS PRESCRIBED, indicate in brackets **1** for correct antibiotic, **0** for incorrect antibiotics

DOSE, indicate in brackets **1** for correct dose, **0** for incorrect dose

DOSE DURATION, Indicate in brackets **1** for correct duration and **0** for incorrect duration.

[illegible]

APPENDIX II: TIME FRAME

ACTIVITY	April 2018	May 2018	June- August 2018	September 2018	October 2018	November 2018
Proposal writing						
Data collection						
Data analysis						
Research report compilation						
Research report presentation						

APPENDIX III: BUDGET

ITEMS	UNITS REQUIRED	UNIT COST(Shs)	TOTAL AMOUNT(Shs)
Printing data collection check lists	112	200	22,400
Printing proposals	2	16,000	32,000
Printing of research report	4	20,000	80,000
Binding of research reports	4	10,000	40,000
Data bundles	2 GB	35,000	70,000
Research assistants	1	100,000	100,000
Data analysis	1	50,000	50,000
Flash disk	1	35,000	35,000
Stationery	Pens, ruler, printing papers, note books	30,000	30,000
Miscellaneous expenses	1	150,000	150,000
Total			609,400

APPENDIX III: INTRODUCTORY LETTER



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Office of the Dean School of Pharmacy

2 October 2018

TO WHOM IT MAY CONCERN

Dear Sir/Madam:

RE: KATUSIME JUDITH (BPH/0029/143/DU)

*NOD - GOOD
IN CHARGE - MEDICAL WARD
Please allow this student to
administer her questionnaire.
Thank you*



The above named student is in year four semester two pursuing a Bachelor of Pharmacy degree in the School of Pharmacy at Kampala International University Western Campus (KIU-WC).

As part of the requirements for the degree, the student is conducting a research study entitled: *"Assessment of Knowledge and practices of health workers in management of typhoid fever at Kampala International University Teaching Hospital"*.

The research project has been approved by the School's Research Committee. The student will work under direct supervision of an academic staff of the School.

Kindly offer her the necessary assistance to conduct this important research. For any additional information, please contact the undersigned.

Thank you for your assistance.

Dr. Jonans Tusiimire BPharm, MSc PhD
DEAN - SCHOOL OF PHARMACY



Dean's Office: Pharmacy Block | Second Floor | Tel: (+256) 774521094/702163848

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"Exploring the Heights"

**ASSESSMENT OF FACILITY INDICATORS AS A COMPONENT OF RATIONAL
MEDICINES USED IN FORT PORTAL REGIONAL REFERRAL HOSPITAL,
KABAROLE DISTRICT WESTERN UGANDA**

BY

TUKEI MICHAEL

BPH/0065/143/DU

SUPERVISOR: MR. OCHWERI ALBERT NYANCHOKA

**A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF PHARMACY IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
OF BACHELORS OF PHARMACY OF KAMPALA
INTERNATIONAL UNIVERSITY.**

BPH/0065/143/DU
 $55\% = \frac{33}{60}$
based on dissertation

DECEMBER, 2010

DECLARATION

I **TUKEI MICHAEL**, hereby declare that this research proposal on “Assessment of facility indicators as a component of Rational Medicines Use in Fort portal Regional referral Hospital Kabarole District western Uganda is my original work with advisory support from my supervisor. This research proposal has never been submitted by anyone to any institution locally or international for any academic purpose. however supportive literature that use quotes or describe an argument or concept done by other authors have been referenced together with secondary literature used to enlighten that this material has been adopted to support the arguments in this study.

Sign 

Date 23/12/2018

APPROVAL

This is to certify that this research proposal entitled assessment of Facility Indicators as a component of Rational Medicines Use in Fort Portal Regional referral Hospital Kabarole District western Uganda has been submitted for an award with my approval as the student's supervisor.

Signed by.....

MR. ONCHWERI ALBERT NYANCHOKA

Supervisor

Date.....

ABBREVIATIONS

UCG	Uganda Clinical Guidance
EML	Essential Medicines List
FRRH	Fort Portal Regional Referral Hospital
WHO	World Health Organization
INRUD	International Network of Rational Use of Drugs
SPARA	Supervisor Performance Assessment of Recognitions Strategy
IQR	Inter-Quartile Range
PHC	Primary Health Care
IRDP	Index for Rational Drug Prescribing
EMHSLU	Essential Medicines and Health Supplies List of Uganda
STG	Standard Treatment Guide Lines
DTC	Drugs and Therapeutic Committees.

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ABSTRACT

BACK BROUND

Despite the complexity of drug use, a number of indications have been developed, standardized and evaluated by world health organization (WHO). These indicators are grouped into three categories namely: Prescribing indicators, Patient care indicators and Facility indicators. This study was aimed at evaluating Facility indicators as a component of Rational Drug Use based on (WHO). Core drug use indicators ^{were assessed} in Fort portal Regional Referral Hospital, Kabarole district, western Uganda.

METHODS

Hospital based quantitative cross sectional study design was employed to evaluate. Rational drug use based on (WHO) core drug use indicators in Fort portal Regional Referral Hospital.

Judgment sampling also sometimes known as purposive or expert sampling technique was employed. Taking WHO recommendations into account, a total of 15 commonly used drugs to treat the top 10 illness was selected having discussed with the prescribers and dispensers .A total of 15 stock books and 30 stock cards were investigated for the selected 15 drugs & healthy suppliers. A focus group discussion involving 15 pharmacy staff & 2 pharmacists was conducted to ascertain consumption habits & data. Furthermore 30 prescribers were interviewed & observation method was employed to confirm the presence of standard treatment guide lines & essential medicines list.

Data were collected using retrospective & prospective structured observational check list. Data were then entered to EPI data version 3.1, exported and analyzed using SPSS version 16.0. Besides, the data were evaluated as per the (WHO) guidelines statistical significance was determined by one way analysis of variance (ANOVA) for some variables. P-value of less than 0.05 was considered statistically significant

Finally tabular presentation was used to present the data.

RESULTS

5 out of 13 visited consultation rooms had standard treatment guide lines. While 9 out of 15 selected drugs and health supplies were available. On average selected key drugs were out of stock for 3 month per year. The health facility had a copy of essential medicines list.

CONCLUSION

Some of the selected essential medicines were in low supplies compared to the consumption data alternating with some days of complete absence of some essential drugs & health supplies which violates the WHO standards. & is presumably one of the factors that fuels irrational drug use in Fort portal Regional Referral Hospital.

KEY WORDS.

- Rational drug use
- World health organization
- Health facility indicators

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Facility indicator is one of the three basic core indicators that (WHO) uses to measure overall performance in rational medicines use. Mahali (2012) stated that the world health organization (WHO) definition of Rational use of medicines as; “patients receiving medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time and at the lowest cost that is affordable to them and the community”. The other two basic indicators used by (WHO) to measure overall performance in rational medicines use are rational prescribing and patient care indicators.

Assen and Oumer (2015) noted that appropriate use of medicines has a huge contribution to the global reduction in morbidity and mortality with medical, social and economic benefits, and in parts credibility to the health facility system. This research was basically focused on only facility indicators basing on the fact that Uganda being one of the developing countries with limited resource envelops. The impact of facility indicator as one of the three basic core indicators of RUM is worthy researching about.

Rational drug use program is an essential element in provision of safe and quality health care to the community. The statistics of the study conducted in Democratic Yemen highlighted its relevance. The summary of the findings showed that “availability and rational use of drugs was assessed in a random sample of 19 peripheral health units in two governorates in Democratic Yemen in which an essential drugs programme had been operational for the past few years.

Findings were compared with those from the 7 health units in one governorate in which no such a program had been started.

On average 27 essential drugs were available in the health units in one governorate in which the program had been started compared with (17) in control areas in which no such a program had been started.

Programme areas carried on average (1) one non essential drug Compared with 17 in control areas.

Average stock was adequate for 4 weeks in programme areas and for 1 week in control areas. Health workers in the programme areas scored slightly, but not significantly, better in a test on the theoretical knowledge on essential drug use. (The latent, January 21, 1989 action programme on essential drugs and vaccines.(WHO) 1211 Geneva-27, Switzerland, Ministry of Health, Aden Democratic Yemen and Ministry of Health Colombo Srilanak, by Hans V. Hogerzeil et al)

1.2 PROBLEM STATEMENT

Among the three basic indicators used to measure overall performance in RMU i.e. (facility indicators, prescribing indicators and patient care indicators), No single study has been conducted to assess the impact of facility indicators on Rational or irrational use of medicines, and yet resource constrains in Government health facilitators coupled with budget cuts in the ministry of health have continuously lowered to the extent that not all the drugs prescribed to patients are actually dispensed to them, instead the word “out of stock” is what is written to patients prescriptions having been issued less medicines than what is prescribed then they end up swallowing less drugs or even completely not getting at all the major drug meant to treat the condition. This leads to irrational use of medicines. There is therefore need to carry out a study on facility indicators to measure rational drug use in FRRH.

The results shall be used to guide decision making and influence policies.

1.3 STUDY OBJECTIVES

1.3.1. General objective:

The aim of this study is to assess the impact of Facility indicators on the rational use of medicines in Fort Portal Regional Referral Hospital.

1.3.2 SPECIFIC OBJECTIVES

- Assess the availability of standard treatment guidelines per consultation room.
- Assess the availability of a copy of essential medicines list of FRRH.
- Assess the availability of 15 commonly used drugs and health supplies in the main pharmacy
- Assess the number of days of stock outs per 15 items selected.

1.4 RESEARCH QUESTIONS

1. Does FRRH have standard treatment guidelines?
2. Does FRRH have a copy of EMHSL?
3. Are commonly used medicines and health supplies available in FRRH?
4. Are there days of stock outs of the 15 selected drugs and health supplies in some occasions of the month

1.5 JUSTIFICATION

All the available rational medicines use studies in literature and several web sites are done mostly on only the two indicators (patient care and prescribing) used by (WHO) to measure rational medicines use. This makes Facility indicator to look as though it has no greater contribution in irrational and rational medicines use and yet low financing contributes greatly to irrational use of medicines when patient's prescriptions in public facility are not served fully.

Among the medicine use studies that have been carried out in Uganda, most of them (SPARS) , supervision performance Assessment and recognition strategy tool is applied to assess the performance of public and not for profit health facilities and design interventions to improve medicine use in Uganda, and the prescribing performance were shown to be low for all facilities levels (Trap et al.2016) because this tools are designed by ministry of health using (WHO) standards, (Trap et al, 2016) studies criticize this approach as being more of managerial than research based because it does not use the WHO basic core indicators correctly.

This justifies the need to carry out this research of facility indicators in FRRH because it is one of the basic 3 indicators used by (WHO) to measure drug use.

1.6 SIGNIFICANCE OF THE STUDY

Availability of medicine's to patients at right quantities rests solely on the shoulders of Facility indicators, Rational prescribing is a good practice needed in health facilities to improve on the use of medicines so as to provide quality health services and save lives; and this can be achieved through assessing the medicines use indicators (WHO, 1993) among

which is facility indicators. There may be correct prescribing and very good patient care indicators but if drugs are not made available to the facility then rational use of medicines can't be achieved. The results of this study shall be used to guide policy making and influence decisions of financing on drugs and health suppliers.

The findings shall also be a reference for the health researchers.

1.7 CONCEPTUAL FRAME WORK

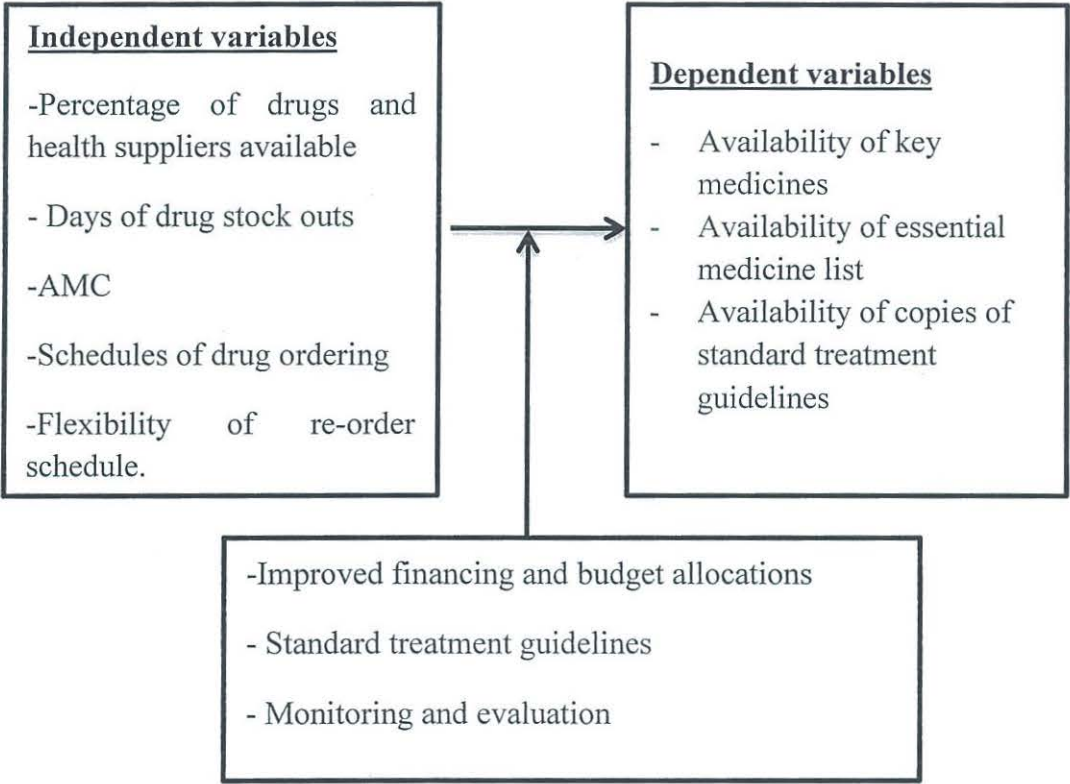


Figure 1: Conceptual frame work for the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Medicine use practice in the world

World Health Organisation acknowledges that worldwide one third of the population can not access the medicines that they need, Zaheer,B. (2007).

Similarly, Hogerzel,H.V., et al (1989). conducted a study to assess the impact of an essential Drugs programme on availability and rational use of medicine, in their findings availability and rational use of drugs was assessed in a random sample of 19 peripheral health units in two governorates in Democratic Yemen in which an essential drugs program had been operational for the past few years. Findings were compared with those from seven health units in one governorate in which no such a programme had been started. On average 27 essential drugs were available in the program areas compared with 17 in control areas. Average stock was adequate for 4 weeks in programme areas and for only 1' week in control areas. Health workers in programme areas scored slightly but not significantly, better in a test on theoretical knowledge on Rational drug use. However programme areas differed considerably from control areas in patterns of drug use, which also had fewer drugs per prescription (1.5 vs. 2.4). The program has significantly improved the availability and rational use of essential drugs in peripheral health units.

In 1993, the WHO published the guideline "How to investigate drug use at health facilities". Selected drugs use indicators "aimed at out lining methods for collection and presentations of information on medicines use in primary health care (PHC) settings. It has also subsequently published information on medicines usage as part of its world medicines situation reports the broadest review on medicines use was published in 2013 which incorporated data from 900 studies covering health facilities at various levels of care in 104 countries between 1990 and 2000(WHO, 1993).

2.2 MEDICINES USE PRACTICE IN AFRICA

Ofori- Asenso et-al (2016) stated that several prescribing patterns studies have been carried out in Africa since the development of the WHO medicine use indicators and the WHO African region is one of the six regions of WHO consisting of 47 members' sates with over 927 million

in habitats in 2013. Ofori-Asenso reported that the region faces one of the greatest disease burden compared to all other WHO regions with life expectancy at birth in Africa beings 58 years in 2013, the lowest among all the WHO regions and 10 years below that of south East Asia (68), region with second lowest life expectancy. Despite the high disease burden, the regions average total health expenditure per capita in 2013 was 222, the lowest among all WHO regions and extremely low when compared to Europe (2214) and America (3873) (Ofori-Asenso et al, 2016).

2.3 medicine use practice in Uganda

Okiror,B.,Onchweri,A.N.,Ondieki,C.M. & Maniga (2015).Availability of essential medicines & health supplies in Kaliro District, noted that medicine supply was low & had stock outs of 23.89% for essential medicines & 27.32% for medical supplies. Their study sighted out “coartem” tablets (artemether/lumefantrine 20/120mg) as having the highest stock outs of 51.6% followed by septrine with stock outs of 32.4%.

Chanddelka and Rataboli (2014) pointed out the importance of medicines use patterns so as to promote rational drug use in developing countries.

According to the base line studies done by Trap et al (2016), all levels of health care facilities in Uganda recorded low adherence to standard treatment guide lines, and thus concluded that, there was poor medicines management in more than 1000 public health care facilities in Uganda.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Materials

- EMHSLU 2012 (essential medicines & health supplies list for Uganda)
- Data collection common drugs form
- Pen & papers
- UCG
- Calculator
- WHO guide lines on RUM
- LAPTOP

3.2 Study design & setting

Facility based quantitative cross sectional study design was employed to evaluate rational drugs use based on (WHO) core drugs use indicators in Fort portal Regional Referral Hospital. The study was conducted from October 3rd to December 2nd 2018. Retrospective cross sectional study was used for facility indicators (drug availability) using consumption data of previous 6 month & prospective cross sectional study design was employed for assessment of availability of standard treatment guide lines and focus group discussion.

3.3 study population

All stock books (15) & stock cards (30) of 15 selected drugs & health supplies for the previous 6 month (1st April to 30th sept 2018) were investigated. A total of 15 consultation rooms were visited & a total of 37 health workers were interviewed.

3.4 sample size determination & sample technique

Judgment sampling also known as purposive or expert sampling technique was employed. Based on WHO criteria, a total of Fifteen (15) essential drugs used to treat ten (10) top common illness in Uganda (Fort portal) was selected & investigated in the study. These drugs & illness were selected by communicating with prescribers, reviewing clinical guide lines & retrieving Ministry of Health report on top killer diseases (Tuesday monitor September 24th /2013) in Uganda.

3.5 Data collection instruments & techniques

Availability of key essential drugs, EDL & STGs was assessed and filled in the facility indicator form accordingly

Data was also collected using observational check list for facility indicators & record computations were then done using the evaluated (WHO) adjusted consumption methods. [Apps.who.int/medicines/docs/en/d/Jh2931e/4./15.html](https://apps.who.int/medicines/docs/en/d/Jh2931e/4./15.html). There are two methods provided for calculation of consumption as follows.

Two methods are available:-

1 calculating from patient registers.

2 Calculating from stock records in the stores of the health facility using the following method

Add up all quantities issued

Consumption=(opening stock +Drugs received)_closing stock

Adjusted consumption for stock outs

Consumption adjusted for stock outs =Recorded consumption*Period in calculation (in month weeks or days)

Period in stock (in month, weeks or days)

E.g.

Consumption adjusted for stock outs=80,000tabs *12month=87,273t
11month

NB. In this scenario there was stock out for one month & period for calculation is 12 month.

Actual tablets issued were 80.000tabs. (a (*WHO resource : essential medicines & health products information portal*) .*Quantification guide lines for essential medicines* gdpa.gov.af/content/q.G.)

To be prudent, the above formulae should be applied to all the 15 drugs individually in case they are out of stock at certain point with in the period.

3.6 inclusion criteria

Only the selected fifteen (15) drugs and health supplies commonly used for the top ten (10) illnesses were used for this study. This was determined by discussion and interview of

prescribers and review of consumption data. And only the records for the previous 6 month were legible for the examination for the purposes of this research.

3.7 Exclusion Criteria

Pharmacy records older than 6 months were not included and examined for the purpose of this study.

Health workers who are not directly attached to the pharmacy, prescription role and records departments were not interviewed.

3.8 Data processing & Analysis

Data was entered to EPI data version 3.1. Then exported and analyzed using SPSS version 16.0. Besides, the data were evaluated as per WHO guide lines

Statistical significance of (0.05)was determined by one way analysis of variance (ANOVA). Finally, tabular presentation & narrative texts was used to present data

CHAPTER FOUR

4.0 RESULTS

Data retrieved from the Ministry of Health (Uganda), revealed the following diseases and illnesses as being the top ten (10) treated in Uganda

Malaria, pneumonia, Anemia, Perinatal conditions, meningitis, tuberculosis, injuries, acute diarrhea, septicemia among others

And in the UCG, the following are the drugs and health supplies used to treat the above diseases

Table 1

1	ACTs
2	Benzyl penicillin
3	Ferous sulfate
4	Amoxycilline
5	Erythromycin
6	Amphotericin B
7	2EHRZ
8	Metronidazole
9	Ceftriaxone
10	Ciprofloxacin
11	Gloves
12	Gauze
13	Cotrimoxazole
14	Loperamide hydrochloride
15	Gentermycin

4.1 HEALTH FACILITY INDICATORS

Only 9 (60%)_key essential drugs and health supplies were available in stock during the study period. On average selected key drugs were out of stock for one and a half month per every 6 month (Table 2)

The hospitals had STG & EML and were being used.

Table 2
Essential drugs selected for FRRH

LIST OF KEY DRUGS		AVAILABILITY:
1	ACTs	–
2	Benzyl penicillin	–
3	Ferrous sulfate	√
4	Amoxicillin capsule	–
5	Erythromycin	√
6	Amphotericin B	√
7	2EHRZ	√
8	Metronidazole	√
9	Ceftriaxone	–
10	Ciprofloxacin	–
11	Gloves	–
12	Gauze	√
13	Cotrimoxazole	√
14	Loperamide Hydrochloride	√
15	Gentermicine	√
Percentage of essential drugs Available		60%
(WHO) standard		100%

Deviation from WHO essential drug criteria by 40%

CHAPTER FIVE

5.1 DISCUSSION.

Out of 15 consultation rooms visited, only 5 had STG for reference, the remaining 10 did not display theirs. This STG & EMLU are mandatory for proper prescription & aid diagnosis. Furthermore, only 60% of the key essential drugs were in stock. The absence of 40% of key drugs was strong indicator of insufficient funding that fluctuates providing drugs that do not complete the whole quarter serving patients. The findings of 60% are much lower than Nigeria's 83% available.

It's possible that lack of adequate recording might have also had an impact in logistic management system & the average number of stock out days was 45 per every six month which causes hick ups in rational use of medicines.

5.2 CONCLUSION:

Most of the core drug use indicators especially on facility indicator were not met by the hospital. WHO recommends 100% availability for essential medicines & 60% in the findings violates (WHO) standards. 1 ½ month stock out of drugs makes drugs un available fueling irrational use of medicines. Facility indicators were therefore found to contribute to irrational use of medicines in Fort portal Regional Referral Hospital.

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INTRODUCTORY LETTER



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Office of the Dean School of Pharmacy

26/November/2018

TO WHOM IT MAY CONCERN

Dear Sir/Madam:

RE: TUKEI MICHAEL (BPH/0065/143/DU)



The above named student is in year four semester two pursuing a Bachelor of Pharmacy degree in the School of Pharmacy at Kampala International University Western Campus (KIU-WC).

As part of the requirements for the degree, the student is conducting a research study entitled: *"Assessment of the Impact of Facility Indicator as a component of Rational Medicines used in Fort Portal Regional Referral Hospital Kabarole District"*.

The research project has been approved by the School's Research Committee. The student will work under direct supervision of an academic staff of the School.

Kindly offer him the necessary assistance to conduct this important research. For any additional information, please contact the undersigned.

Thank you for your assistance


Dr. Jonans Tusiimire BPharm, MSc
DEAN - SCHOOL OF PHARMACY



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"Exploring the Heights"