

Factors associated with Dispensing Practices in Retail Pharmacies in Kampala District . A Cross-Sectional Study.

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Abstract

Background:

There is a growing global problem of inappropriate dispensing practices in retail pharmacies for drugs including antibiotics and even controlled drugs. Therefore a study was carried out to assess the factors associated with dispensing practices of drugs in retail Pharmacies in Kampala district.

Methodology:

The study design was cross sectional analytical study and a sample of 385 respondents was selected using a simple random sampling technique and a questionnaire was used to collect data.

Results:

The study found out that majority (52.9%) of the pharmacies had inappropriate dispensing practices of drugs. The study also showed that majority (60.4%) of the retail pharmacies never had designated areas in their facilities for counseling of patients.

The study also showed that about 30% of pharmacies which had a designated area for counseling of patients practiced appropriate dispensing practices of drugs as compared to those that never had designated areas for counseling. Majority (41.7%) of the dispensers in the retail pharmacies were Nurses and 53.4% of the dispensers had not participated in an in-service training program on dispensing medicine. The nature of the professional and frequency of previous in-service training program determined the dispensing outcomes.

Conclusion:

The study revealed that the inappropriate dispensing practices in pharmacies were attributed to; profession, experience of dispensing, having attended dispensing training and the frequency of attendance of training, having designated areas for counseling and presence of structures for reporting patient complaints.

Recommendations:

In order to improve on the appropriateness of dispensing practices in retail pharmacies, Regular in service training by supervising pharmacists should be enhanced. Pharmacies should designate counselling areas for patients and regulatory agencies, mainly NDA should increase supervision visits to pharmacies and ensure that dispensing guidelines are adhered to by all pharmacies.

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1. Background

Pharmacies are a primary source of health-care services in low and middle income coun-

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tries including Uganda especially where patient to doctor ratio is low (World Health Organization, 2001). (Hodgkin et al., 2015) Pharmacies are often the first point of call for the management of common ailments such as cough, cold, flu and infections including Malaria, Enteric fever and Pneumonia (Szeinbach et al., 2007).

Globally, more than 50% of all medicines are prescribed, dispensed or sold inappropriately while, 50% of patients fail to take the prescribed drugs correctly. (Maharaj et al., 2020). Moreover, about one-third of the world populations lack access to essential medicines (Michael E. Aulton, 2018).

There is a growing global problem of inappropriate dispensing practices in retail pharmacies for drugs including antibiotics and even controlled drugs (Kamba et al., 2020) The problem of dispensing of controlled medicines is increasing in pharmacies in the United States, Canada and Eastern Europe and have drawn the most attention (Scott, 2016).

However, recent trends in Africa and Asia suggest that inappropriate dispensing practices are rapidly expanding. In Nigeria, a recent report indicates that 4.7% of its population (or 4.6 million people) engaged in non-medical use of prescription opioids in 2018 and 2.4% of Nigeria's engaged in non-medical use of over-the-counter cough syrups containing opioids in the year 2019. (Dorothy et al., 2021a) A study in Nigeria revealed that prescription medication error was the most common medical error at 95.2% among medical personnel (Parker et al., 2022).

In Uganda, 18% of health care professionals disclosed having made medication errors while treating or dispensing to patients. In Uganda, study conducted to assess the prevalence of dispensing errors revealed that 47.3% of drugs are dispensed in errors (Dorothy et al., 2021b)

Medication errors arising from inappropriate dispensing practices impose great economic impact on the healthcare system, society, and patients. (Mukonzo et al., 2013) The impact on health organizations, health workers, and patients include prolonged hospitalization, loss of trust, and loss of productivity respectively, loss of lives,

adverse drug reactions and resistance to effective antimicrobial agents.

Irrational dispensing practice like dispensing of prescription only drugs at partial dose and even without a prescription, poor labelling of the dispensed drugs, lack of patient counselling, incomplete compiling and recording of prescriptions and charging patients unreasonably high price for dispensed items are common in developing countries (Ozdemir, 2008)

Inappropriate dispensing practices has attributed to factors including dispensers incompetence like failure to interpret a prescription and negligence to label the drugs dispensed, patients buying medicines without prescriptions, (Okerosi et al., 2017), poor retail pharmacy settings and poor implementation of pharmacy guidelines by NDA. In Uganda, a study done on the dispensing practices of drugs used to treat non-communicable diseases (Ngongoni et al., 2018) showed that poor understanding of the medications dispensed leads to non-adherence to that particular drug as indicated by many other studies.

In Uganda, studies in retail pharmacies have focused more on understanding the role of drug shops, quality of services provided, feasibility of using rapid diagnostics at drug shops, delivering family planning products through drug shops, among others (Kitutu et al., 2017)

However, there is limited information on the factors affecting the dispensing practices of drugs yet, this would provide an important starting point for designing feasible interventions aimed at improving the performance of retail pharmacies so that they can effectively serve the communities. The aim of this research is to assess the factors associated with dispensing practices in retail pharmacies in Kampala city.

2. METHODOLOGY

2.1. Study design

A cross sectional analytical study was carried out using semi structured questionnaire which was used to collect data on factors associated with dispensing practices at a point in in time .this study

design was selected because it is cheap and consumes less time.

2.2. Study setting

The study was conducted in the retail pharmacies within Kampala district. Kampala is the capital and largest city of Uganda. The city proper has a population of more than six million people. and is divided into the five political divisions of Kampala Central Division, Kawempe Division, Makindye Division, Nakawa Division, and Rubaga Division. It has a rapidly growing population. Of the 2,656 registered pharmacies in the country, there are 786 wholesalers, 1557 retailers and 134 those who give medical services.(NDA, 2021) 42% of these registered pharmacies are located within Kampala city. This makes Kampala the best area of study since it would constitute the most percentage of pharmacies in the country and since Kampala has higher population of people who depend on pharmacies for pharmaceutical services. Data was collected in the month of September 2022.

2.3. Study Population

The study was conducted in the retail pharmacies within Kampala capital city authority. Kampala alone has 1,106 registered licensed outlets that dispense drugs to people.(NDA, 2021).The study will focus on permanent or part-time Dispensers and patients/clients aged above 18 years working in the retail pharmacies or being clients in the retail pharmacies above pharmacies in the month of August 2022 who will consent to the study.

2.4. Sample Size

The sample size was determined statistically using the statistical equation by Kish Lesly.

$$n = \frac{Z^2 P(1 - P)}{D^2}$$

Where n represents the desired sample size, Z represents the number of standard normal deviations usually set at 1.96 which corresponds to 5% level of confidence, P represents the proportion of the target population estimated to have a particular

characteristic; in this case, the current prevalence is not known. We assume prevalence of 50% at 5% confidence interval, therefore $P = 0.5$. D represents precision of the study (degree) of accuracy desired. In this case, 0.5 is the accepted error. (Lwanga & Cho-Yook, 1986)

Our sample size n is therefore $\frac{1.96^2 0.5(1-0.5)}{0.05^2} = 385$

Because prevalence is not known on the factor associated with dispensing practices a sample size of 385 patients was used, assuming the prevalence is 50% at 5% confidence interval.

2.5. Eligibility Criteria

2.5.1. Inclusion criteria

Only licensed retail pharmacy outlets were included in the study and Dispensers who are permanent or locum dispensers in retail pharmacies registered with their professional bodies and clients who had bought drugs in the participating pharmacies at that particular time

2.5.2. Exclusion criteria

Retail pharmacy outlets and dispensers who did not consent to the study were excluded.

2.6. Sampling Technique and procedure

This study used a simple random sampling technique to select retail pharmacies in Kampala city. A list of Pharmacies was generated from the sampling frame obtained from National Drug Authority. Each Pharmacy was assigned a sequential number and by using random number generator software, a sample of 385 Pharmacies were picked. The dispensers in pharmacies were selected by convenience sampling method.

2.7. Definition of variables

2.8. Dependent variables

The main variable in this study is dispensing practices. It is measured as a binary

Outcome (Appropriate/Inappropriate dispensing practices) from a composite score of some key dispensing variables. According to the World Health Organization (WHO) dispensing practices is a measure of the following indicators; the right drug, given to the right patient, at the right dose

and frequency, adequate counselling and Clear instruction on a label

2.8.1. Independent variables

The independent variables of interest are stratified into three main categories.

2.9. Dispenser variables:

Socio-demographic characteristics, years of experience, Exposure to continuous professional training, Professional category And Awareness of guidelines

2.10. Facility Level Indicators

Availability of reference materials on dispensing, availability of counselling area and Supervision from regulatory authority

2.11. Data collection tools

A well-structured WHO modified document on proper dispensing practices was adopted in designing the questionnaire. This will served the main instrument for collection of primary data for this study.

2.12. Data Collection Procedure

Questionnaires were administered to dispensers for data collection first before client exit interviews were are conducted. This was done using a Dispenser/ Patient based developed questionnaire. However, data collected on labelling of medicines dispensed were obtained through observation of the labels on the dispensed medicines. In each retail pharmacy selected, one dispenser was selected and one patient who bought drugs and served by the selected dispenser.

2.13. Quality control

Before the respondent asked the question, information was given to them about how they understand the words written and the idea about what the questionnaire says. They were also informed about the objective of the study, so that every respondent understands the question well and give an attention (with responsibility)

2.14. Data Management

Data was captured using questionnaire and uploaded in Microsoft Excel spreadsheet. Data was cleaned, sorted and coded on Excel spread sheet before it was uploaded on SPSS for analysis.

2.15. Data Analysis

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

2.16. Ethical considerations

The research proposal was presented to Health Tutor's College Mulago, Research and Ethics committee for permission to be granted, then an introduction letter was obtained from the Health Tutor's College for National Drugs Authority (NDA) to grant permission to carry out the study in retail pharmacies .Permission was sought from Pharmacy in charge Pharmacists and owners before data collection. Written and verbal consent were obtained from research participants.

3. RESULTS

Results from table 1 show the socio-demographic characteristics of dispensers who participated in the study. Results showed that 66.7% of the dispensers were females and 33.3% were males. According to age, 33.9% were aged 18-29 years old, 33.1% were 30 to 39 years, 24.7% were 40 to 49 years and the least number of dispensers were aged 50 years and above.

The study also showed that 48.4% of the dispensers had a college education, 30.5% had diplomas and 21.1% had a bachelor's level of education and above. According to marital status, 51% of the dispensers were single, 39.6% were married, 2.9% had divorced and 6.5% said they had another marital status.

Table 1: **Socio-demographic characteristics of dispensers working in retail pharmacies of Kampala city in September 2022.**

Variables	Frequency	Percentage
Gender		
Male	128	33.3
Female	256	66.7
Age		
18-29	130	33.9
30-39	127	33.1
40-49	95	24.7
50 years and above	32	8.3
Education qualification		
College	186	48.4
Diploma	117	30.5
Bachelors and above	81	21.1
Marital status		
Married	152	39.6
Single	196	51.0
Divorced	11	2.9
Others	25	6.5
Religion		
Catholic	120	31.3
Muslim	87	22.7
Protestant	112	29.2
Pentecostal	33	8.6
Others	32	8.3

Source: Primary data, 2022

Findings on religion showed that 31.3% of the dispensers were Catholics, 29.2% were Protestants, 22.7% were Muslims, 8.6% were Pentecostals and 8.3% belonged to other religious affiliations. Results also showed that 41.7% of the dispensers were nurses, 25% were pharmacy assistants, 16.7% were pharmacy technicians, 8.3% were pharmacists and 8.3% were pharmacy interns.

3.1. Appropriateness of dispensing practices of drugs in retail pharmacies in Kampala District

The level of appropriateness was measured on a scorecard of 12 points. On the questions of dispensing, those who got more than 9/12 (75%) points and above were considered appropriate and

those who scored less than 9/12 were considered to be inappropriate dispensing practices.

Results from the analysis showed that 52.9% of the dispensers had inappropriate practices of dispensing drugs and 47.1% had appropriate practices in dispensing drugs.

Results from the study showed that 224(58.3%) of the dispensers reported that NDA is the agency/organization responsible for the supervision of their pharmaceutical activities in the pharmacy. 152 (39.6%) mentioned that it's the pharmaceutical society of Uganda and 8 (2.1%) said it's the medical and dental practitioners council.

Results also in table 3 show that 248(64.6%) of the dispensers had their facilities supervised within the last 6 months during the time the study was conducted and 136(35.4%) dispensers

Table 2: Appropriateness of dispensing practices for drugs in retail pharmacies in Kampala city in September 2022

Level of appropriateness	Frequency (n=384)	Percent (%)
Inappropriate	203	52.9
Appropriate	181	47.1
Total	384	100.0

Source: Primary data, 2022

Table 3: Responses

Variable	Frequency	Percentage
Agency that supervises the pharmacies		
NDA	224	58.3
Medical and dental practitioners council	8	2.1
Pharmaceutical society of Uganda	152	39.6
Have you had supervisory visits in 6 months?		
Yes	248	64.6
No	136	35.4
Accessibility to UCG and BNF		
Yes	376	97.9
No	8	2.1
Presence of designated area for counseling		
Yes	152	39.6
No	232	60.4
Availability of structure for reporting patient complaints		
Yes	277	72.1
No	107	27.9

Source: Primary data

had not been supervised. The study also showed that 376(97.9%) had access to UGC and BNF and could access them manually or online while 2.1% didn't have access to them.

The study also showed that 60.4% of the dispensers never had designated areas in their facilities for counseling patients and 152(39.6%) had a designated area for counseling patients in their facility. 72.1% of the dispensers also reported that they had a structure in place for reporting patient companies like adverse drug reactions about medication and 107(27.9%) did not have the structure in place.

From the findings of the study, logistic binary regression was performed at the bivariate analysis level. From the findings above, it can be seen

that there was a relationship between the type of agency that supervises the retail pharmacies and the dispensing practices among dispensers. It can also be seen that the majority 113(29.4%) of the dispensers practiced appropriate dispensing practices were supervised by the pharmaceutical society of Uganda.

Findings also showed that there was a relationship between dispensing practices and being supervised within the last 6 months. There was also a relationship seen at bi-variate analysis between dispensing practices and availability of the designated area for counseling patients. It can also be seen that 29.4% of the dispensers who had designated area for counseling practiced appropriately the dispensing practices as compared to those who

Table 4: Bi-variate analysis of the facility factors influencing dispensing practices of drugs in retail pharmacies

Variable	Dispensing practices		X ²	P-value
	Inappropriate	Appropriate		
Awareness of agency that supervises the pharmacies				
Pharmaceutical society of Uganda	39(10.2)	113(29.4)	0.2	0.000
NDA	164(42.7)	60(15.6)		
Medical and dental practitioners council	-	8 (2.1)		
Supervised within 6 months				
Yes	164(42.7)	84 (21.9)	4.8	0.000
No	39(10.2)	97(25.3)		
Presence of designated area for counseling				
Yes	39(10.2)	113(29.4)	0.1	0.000
No	164(42.7)	68(17.7)		
Availability of structure for reporting patient complaints				
Yes	170(44.3)	107(27.9)	3.5	0.000
No	33(8.6)	74(19.3)		

never had designated areas for counseling.

Results also showed that there was a relationship between dispensing practices and the availability of the structure for reporting patient complaints. From the table, it can be seen that 27.9% of the dispensers who practiced appropriate dispensing practices had structures in place for reporting patient complaints.

3.2. Relationship between dispenser factors and dispensing practices of drugs in retail pharmacies in Kampala city in September 2022.

Results from the univariate analysis showed that the majority 160 (41.7%) of the dispensers in the retail pharmacies were Nurses, followed by 96(15%) pharmacy assistants, 64(16.7%) pharmacy technicians, 32 (8.3%) pharmacy interns and 32 (8.3%) were pharmacists. According to experience, 33.3% had an experience of one year or less, 33.3% had an experience of 2 to 3 years, 25% had the experience of 4 to 5 years and 8.4% had the experience of more than 5 years.

The results also showed that 205(53.4%) of the dispensers had not participated in an in-service training program on dispensing medicine, and only 179(46.6%) of the dispensers had participated in the training program. Results also showed that only 104(27.1%) of the dispensers had participated in the in-service training program within the last 12 months of the study, and 280 (72.9%) never participated in the in-service training program within the 12 months.

Among those who had participated in the in-service training within 12 months (104), 54.8% attended the program within 12 months more than once and 45.2% attended only once.

Source: Primary data, 2022

Results in table 6 at Bivariate analysis showed that the nature of the dispenser's profession, the experience of dispensers, having attended an in-service training program on dispensing and

frequency of attendance of the training program within the last 12 months has a relationship with the dispensing practices among dispensers in retail pharmacies

Table 5: Dispenser factors

Variable	Fre- quency	Percent- age
Profession		
Pharmacist	32	8.3
Pharmacy technician	64	16.7
Nurse	160	41.7
Pharmacy assistant	96	25.0
Pharmacy intern	32	8.3
Experience		
one year or less	128	33.3
2-3 years	128	33.3
4-5 years	96	25.0
More than 5 years	32	8.4
Practiced in-service training on dispensing		
Yes	179	46.6
No	205	53.4
Participation in in-service training program within 12 months		
Yes	104	27.1
No	280	72.9
Frequency of attendance		
Once	47	45.2
More than once	57	54.8

Source: Primary data, 2022

4. Discussion:

4.1. *Appropriateness of dispensing practices of drugs in retail pharmacies in Kampala District.*

This study revealed that the majority of the dispensers 5 out of 10, conducted inappropriate practices of dispensing drugs while less than half of the dispensers practices appropriately in dispensing drugs. This shows that there are still poor practices of dispensing drugs among dispensers in retail pharmacies. Inappropriate practices still exist in Uganda as also reported by Kamba et al. (2020). In the study, it was reported that irrational dispensing is prevalent in public health facilities with only about 10% of prescribed medicines being labeled appropriately.

Appropriate practices of dispensing among the dispensers make clients take medication without

any special instructions which in turn leads to adverse effects/side effects that could be severe to the clients. According to (Parker et al., 2022), Problems with prescription drug

labeling was 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.

4.2. *Relationship between facility-level factors and with dispensing practices of drugs in retail pharmacies.*

This study revealed that there was a relationship between the type of agency that supervises the dispensers and the dispensing practices. This study also showed that the majority (29.4%) of those who practiced appropriate methods of dispensing, was supervised by the pharmaceutical society of Uganda followed by those supervised by

Table 6: Relationship between dispenser factors and dispensing practices of drugs in retail pharmacies in Kampala city

Variable	Dispensing practices		X ²	P-value
Profession	Inappropriate	Appropriate		
Pharmacist	10(2.6)	22(5.7)	0.907	0.000
Pharmacy technician	8(2.1)	56(14.6)		
Nurse	138(35.9)	22(5.7)		
Pharmacy assistant	39 (10.2)	57(14.8)		
Pharmacy intern	8(2.1)	24(6.2)		
Experience				
one year or less	125(32.6)	3(0.8)	4.731	0.000
2-3 years	39(10.2)	89(23.2)		
4-5 years	39(10.2)	57(14.8)		
More than 5 years	-	32(8.3)		
Practiced in-service training on dispensing				
Yes	111(28.9)	68(17.7)	2.0	0.001
No	92(24.0)	113(29.4)		
Participation in in-service training program within 12 months				
Yes	55(14.3)	49(12.8)	1.0	0.996
No	148(38.5)	132(34.4)		
Frequency of attendance				
Once	17(16.3)	30(28.8)	0.283	0.002
More than once	38(36.5)	19(18.3)		

NDA. Pharmacists have been trained to purely handle and guide the dispensers on the drugs they have to issue to patients depending on the nature of the conditions patients present with. These have high practical knowledge than any other profession in dispensing. Therefore, there is a need for a highly qualified professional to work in the pharmacies. Lack of dispensing facilities and dispensing of medicines by an untrained person may lead to wastage and irrational dispensing of medicines (Meena et al., 2022).

The study also revealed that being supervised within the last 6 months when the study was conducted was associated with dispensing practices. This meant that having been supervised in the last 6 months by the agencies led to the appropriate practices in dispensing as dispensers try to ensure that they practice better. Supervision is a

key factor for compliance to set standards for the operation of pharmacies in Uganda (NDA Licensing guidelines, 2018) and therefore the continued supervision of pharmacies helps to promote appropriate practices among dispensers.

There was also a relationship seen in the bivariate analysis between dispensing practices and the availability of the designated area for counseling patients. It can also be seen that the majority 29.4% of the dispensers who had designated areas for counseling practiced appropriately the dispensing practices as compared to those who never had designated areas for counseling. This means that those with counseling areas can provide enough information to the clients and also give space for clients to inquire about the drugs and their side effects. Pharmacies need to have counseling areas to counsel patients (Layqah et

al., 2018).

This study also found a relationship between dispensing practices and the availability of the structure for reporting patient complaints. It was also seen that the majority (27.9%) of the dispensers who practiced appropriate dispensing practices had a structure in place for reporting patient complaints. Therefore having an appropriate structure for reporting patient complaints is associated with appropriate dispensing practices. Pharmacies are recommended to have a feedback mechanism for reporting client complaints. This helps to promote better practices whereby clients who have not understood the medication can reach the facility for help, this can be via telephone or other channels of communication (Tariq et al., 2018).

4.3. Relationship between dispenser factors and dispensing practices of drugs in retail pharmacies in Kampala District.

The study revealed that the profession had a relationship with dispensing practices. This means that the type of profession also influences the level of dispensing practices among dispensers. It was also found that the majority of the Nurses (35.9%) had inappropriate practices, not like pharmacists, pharmacy technicians, and pharmacy assistants. This means that these had better appropriate dispensing practices. Sinha (2014) Also found out that pharmacists play a key major role in dispensing as they check prescriptions provided by the physicians before even dispensing the medication. The study further revealed that the type of profession one employs in a pharmacy also influences the dispensing practices (Sinha, 2014). Although nurses are the most dispensers in pharmacies, the pharmacists normally feel that they are more qualified to dispense and this has led to inappropriate dispensing practices among nurses.

The study also revealed that there was a relationship between experience and appropriateness in dispensing practices. A majority (23.2%) of those who had an experience of 2 to 3 years and more had appropriate practices than those who had the experience of 1 year or less. Experience is also a key factor influencing performance on

jobs (Mustafa, 2013). Therefore, having experience improves one's practices in terms of dispensing. People who have stayed for more years in dispensing have a lot of experience in dispensing and can practice appropriately than those with one year or less experience.

The study also showed that in-service training program participation within 12 months had a relationship with dispensing practices. This means that the level of training influences dispensing practices. That is to say, an increase in the level of training leads to a positive change in better practices of dispensing among dispensers. The study also showed a positive relationship between the frequency of attendance at in-service training and dispensing practices. Therefore, training plays a key role in the improvement of dispensing practices among dispensers. All staff members dispensing must be trained in the knowledge, skills, and practices which are necessary to dispense the range of medicines prescribed at the facility (Mayora et al., 2018). Therefore, knowledge of dispensers is one of the factors influencing dispensing practices in pharmacies.

5. Conclusion

This study was carried out to find out the factors associated with dispensing practices in retained pharmacies in Kampala District. The study looked at 3 objectives; to determine the appropriateness of dispensing practices, and to find out the dispenser factors and facility factors influencing dispensing practices.

The study revealed that there are inappropriate dispensing practices among dispensers in Kampala District Pharmacies. The dispenser factors influencing dispensing practices were; profession, the experience of dispensing, having attended dispensing training, and the frequency of attendance of training. The study also revealed the facility factors influencing dispensing practices and these were; the type of agency that supervises pharmacies, being supervised within 6 months, having designated areas for counseling, and presence of structure for reporting patient complaints.

6. Recommendations

There is a need for the ministry of health to ensure that all retail pharmacies have and put in place the guidelines for dispensing medicines to help the dispensers adopt the right dispensing practices. This should also be followed up by implementing partners such as the NDA and the pharmaceutical society of Uganda to ensure pharmacies serve patients appropriately.

There is also a need for more training in dispensers and this can be done in-service and on the job to promote better practices of dispensing. Pharmacists need to also supervise the facilities they are allocated to ensure that all guidelines are complied with.

There is also a need to ensure that all pharmacies have a designated area for counseling and that structures for reporting patients' complaints are put in place at all pharmacies to promote communication with patients in case of any feedback and side effects. This will promote improved health care.

Pharmacies should be encouraged to have complaints/suggestion boxes as well as have designated areas for patient counseling as this will improve the provision of quality health care services.

There is a need for staff dispensing drugs to patients to ensure that all required instructions are properly written, clear and understandable to patients to avoid issues of irrational drug use.

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8. LISTS OF ABBREVIATIONS

ADEs: Adverse Drug Effects

ARV: Antiretroviral drugs

IOM: Institute of Medicine

LMICS: Low and Middle Income Countries

NDA: National Drug Authority

PFP: Private for Profit

POM: Prescription only medicines

USPPRN: US Pharmacopeia Practitioner's reporting Network

WHO: World Health Organization

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10. OPERATIONAL DEFINITIONS

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Table 7: **Operational definitions**

Dispensing practices	These are activities of dispensers in the pharmacy aimed at ensuring that an effective form of the correct medicine is delivered to the right patient, in the correct dosage and quantity, with clear instructions and in a package that maintains the potency. In this study dispensing practices were determined using the WHO, 2012 guidelines on good pharmacy practice (standards for quality of pharmacy services) good dispensing practices. A Score of more than 9 out of 12 indicates appropriate dispensing practices while a score of less than 9 out of 12 indicates inappropriate dispensing practices
Retail pharmacy	These are Pharmacies that sell both prescription only medicines and over the counter medicines directly to patients/clients over seen by licensed pharmacies with valid licenses from National Drug Authority.

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Author biography

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