



EVALUATION OF DISPENSING PRESCRIPTION ANTIBIOTICS AT THE COMMUNITY PHARMACY OUTLETS IN MOMBASA COUNTY

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ABSTRACT

The role of the pharmacist or pharmaceutical technologist is to scrutinize errors in the prescription made and make appropriate recommendations/interventions to the prescriber if any. In many countries, including Kenya, Nigeria and India, drug retailers prescribe and sell medicines over-the-counter. The WHO advocates that rational dispensing principles should be followed at all times to ensure that patients receive adequate information regarding the use of dispensed medicines, so as to achieve the desired benefits. The objective of the study was to undertake an evaluation dispensing prescription antibiotics at the community pharmacy outlets. A descriptive cross sectional study design was used by the study. A sample size of 196 was calculated using Fisher's formula. Stratified random sampling (nth of 10) was used to select community pharmacy outlets within Mombasa town. Simple random sampling was used to recruit the subjects into the study by assigning natural numbers to all prescriptions with an antibiotic during the study period. A well designed checklist developed to capture study variables was used to collect data from the prescriptions as well as three interviews were carried out among the patients and pharmacists. The collected data was edited and transcribed before entered into SPSS version 21 for analysis and interpreted using tables, pie charts and graphs. The study findings show that the patient (89.3%) and prescribers name and address (83.7%) were well captured followed by prescriber signature (75.3%), safe dosing (75.5%), prescription date (63.3%), cautionary information (62.2%) and stamp (38.5%). Bivariate analysis findings show that all prescription legality or validity parameters were statistically significant. The study recommends that the prescribers should always adhere to prescribing guidelines, embrace the legality of prescriptions on appropriate diagnosis, appropriate drug and appropriate patient in order to limit any likelihood of drug misuse or abuse. The pharmacists and pharmaceutical technologists should always not assume provided their patients with neat, clear and elaborate drug labels because it can reduce any likely mistakes and promote appropriate drug use

INTRODUCTION

Once prescribing is complete, the dispensing stage is when patients receive their medications. The dispensing procedure entails receiving and cross-checking the prescription for validity or legality, safety and appropriateness, review on the patients' dispensing history, Prepare and check products through product selection, label and assemble dispensed products, supply the prescription and counsel the patient (PPB, 2012).

Often, the patient will present a prescription from the prescriber instructing the pharmacist to issue the patient on what has been instructed. Dispensing is often carried out by a trained pharmacist or pharmaceutical technologist. In clinical practice, the separation of prescribing and dispensing activities is considered to be a safety mechanism to ensure an additional independent assessment of the proposed therapy before patient begins treatment (Gurbani *et al*; 2011).

The role of the pharmacist or pharmaceutical technologist is to scrutinize errors in the prescription made and make appropriate recommendations/interventions to the prescriber if any. The patient also receives instructions on the use of

medicines and this is like to enhance adherence if they follow those instructions (Chou *et al*; 2003).

In many countries, including Kenya, Nigeria and India, drug retailers prescribe and sell medicines over-the-counter. The more they sell the more income they generate, leading to overuse of medicines, particularly the more expensive medicines. Unrestricted availability of medicines such as antibiotics leads to overuse, inappropriate self-medication and non-adherence to dosing regimens (Kar *et al*; 2010).

The impact of irrational medicines use can vary widely. Firstly, when medicines are used inappropriately, the risk of adverse drug reactions (ADRs) is increased, especially in geriatric patients or in co-morbid individuals who may have compromised physiologic functions (Hamilton *et al*; 2003). The cost implications of ADRs can also be enormous (Pirmohamed, 2004)

The WHO advocates that rational dispensing principles should be followed at all times to ensure that patients receive adequate information regarding the use of dispensed medicines, so as to achieve the desired benefits (MMS and MPHS, 2010). For instance, if dispensing practices such as counting, packaging,



and labeling are poorly executed; they are likely to impact the patient's confidence in the dispensed products, and subsequently

RESEARCH STUDY DESIGN

A descriptive cross sectional study design was used by the study. The design was chosen due to its ability to investigate a condition or a problem in a defined population at a specific point or period in time without attempt to draw any inferences for the prevalence. The fisher's et al formula was used to calculate the study sample size of 196. Stratified random sampling (nth of 10) was used to select community pharmacy outlets within Mombasa town. Simple random sampling was used to recruit the subjects into the study by assigning natural

compliance to therapy.

numbers to all prescriptions with an antibiotic during the study period. Then all prescriptions with an even number and patients being willing to participate in the study by signing a written informed consent were recruited. A well designed checklist developed to capture study variables was used to collect data from the prescriptions as well as three interviews were carried out among the patients and pharmacists. The collected data was edited and transcribed before entered into SPSS version 21 for analysis and interpreted using tables, pie charts and graphs. There assured confidentiality of collected subjects data at all stages

RESULTS

Table 1: Receiving and scrutinizing of prescriptions

Variable	Category	Frequency	
Prescribers details	Satisfactory	164(83.7%)	
	Unsatisfactory	32(16.3%)	
Patient details	Satisfactory	175(89.3%)	
	Unsatisfactory	21(10.7%)	
Items dispensed	Clear	164(83.7%)	
	Unclear	32(16.3%)	
Legality			
	Date	Yes	124(63.3%)
		No	72(36.7%)
	Signature	Yes	148(75.5%)
		No	48(24.5%)
	Stamp	Yes	76(38.8%)
No		120(61.2%)	
Safety			
	Appropriate indication	Yes	58(29.6%)
		No	138(70.4%)
	Safe dosing	Yes	148(75.5%)
		No	48(24.5%)
	Contraindications	Yes	122(62.2%)
No		74(37.8%)	

Table 2: Prescription review

Variable	Category	Frequency
Patient dispensing history		
	Treatment	
	New	168(85.7%)
	Changed treatment	28(14.3%)
Duplication	Yes	72(36.7%)
	No	124(63.3%)
Possible drug interaction	Yes	38(19.4%)
	No	158(80.6%)
Compliance issues	Yes	179(91.3%)
	No	20(8.7%)
Misuse or abuse	Yes	47(24%)
	No	149(76%)
Patient factors (allergy, age, pregnancy)	Yes	181(92.3%)
	No	25(7.7%)



Product selection

Appropriate drug	Yes	188(95.9%)
	No	8(4.1%)
Brand	Yes	162(82.7%)
	No	34(17.3%)
Strength	Yes	190(96.9%)
	No	6(3.1%)
Formulation	Yes	189(96.4%)
	No	7(3.6%)
Quantity	Yes	191(97.4%)
	No	5(2.6%)

Table 3: Prepare, check, issue medicines and counseling

Variable	Category	Frequency
Labeling		
	Name of patient	Present 169(86.2%) Absent 27(13.8%)
Generic name dispensing	Yes	124(63.3%)
	No	72(36.7%)
Strength of drug	Present	134(68.4%)
	Absent	62(31.6%)
Dosage instructions	Available	185(94.4%)
	Un available	11(5.6%)
Duration of treatment	Provided	104(53.1%)
	Un provided	92(46.9%)
Date of dispensing	Available	38(19.4%)
	Un available	158(80.6%)
Name of dispensing institution	Indicated	49(25%)
	Not indicated	147(75%)
Counseling aids	Present	25(12.8%)
	Absent	171(87.2%)
Counseling		
	Correct patient	Yes 175(89.3%) No 21(10.7%)
Correct medicines	Yes	184(93.9%)
	No	12(6.1%)
Documentations	Present	172(87.8%)
	Absent	24(12.2%)
Storage / discard instructions	Yes	104(53.1%)
	No	92(46.9%)
Patient instructions	Understood	98(50%)
	Not understood	98(50%)
Patient clarifications	Answered	105(53.6%)
	Un answered	91(46.4%)
Patient signature for supplied drugs	Present	25(12.8%)
	Absent	171(87.2%)

Level of patient's satisfaction

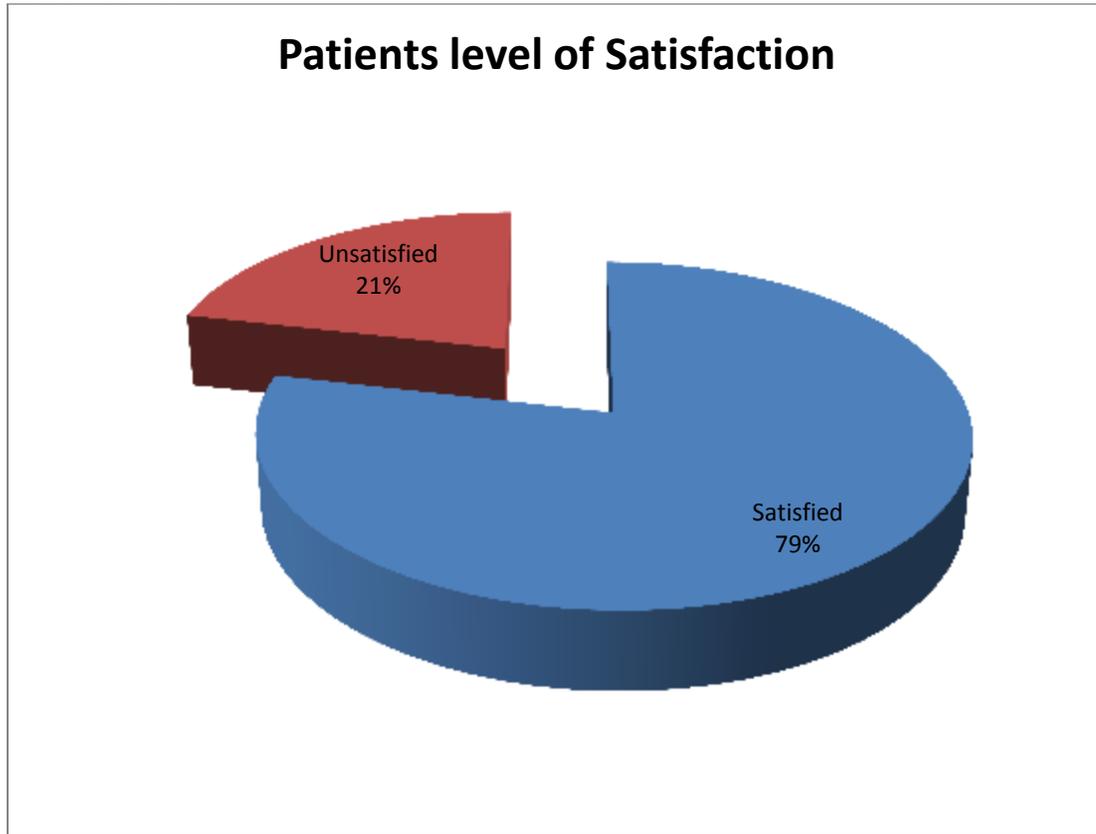


Figure 1: Patient's satisfaction level

Table 4: Bivariate analysis on receiving and scrutiny of the prescription

Variable	Category	Frequency	Patient's view on prescription dispensing		Df	Chi square	P value
			Satisfied (n=154)	Unsatisfied (n=42)			
Prescribers details	Satisfactory	164(83.7%)	152(98.7%)	12(28.6%)	1	118	0.000
	Unsatisfactory	32(16.3%)	2(1.3%)	30(71.4%)			
Patient details	Satisfactory	175(89.3%)	150(97.4%)	25(59.2%)	1	49.495	0.000
	Unsatisfactory	21(10.7%)	4(2.6%)	17(40.8%)			
Items dispensed	Clear	164(83.7%)	147(95.5%)	17(40.8%)	1	73	0.000
	Unclear	32(16.3%)	7(4.5%)	25(59.2%)			
Legality							
Date	Yes	124(63.3%)	123(79.9%)	1(2.4%)	1	85.262	0.000
	No	72(36.7%)	31(20.1%)	41(97.6%)			
Signature	Yes	148(75.5%)	146(94.8%)	2(4.8%)	1	144.69	0.000
	No	48(24.5%)	8(5.2%)	40(95.2%)			
Stamp	Yes	76(38.8%)	61(39.6%)	15(35.7%)	1	0.211	0.646
	No	120(61.2%)	93(60.4%)	27(64.3%)			
Safety							
Appropriate indication	Yes	58(29.6%)	49(31.8%)	9(21.4%)	1	1.71	0.191
	No	138(70.4%)	105(68.2%)	33(78.6%)			
Safe dosing	Yes	148(75.5%)	147(95.5%)	1(2.4%)	1	158.80	0.000
	No	48(24.5%)	7(4.5%)	41(97.6%)			
Contraindications	Yes	122(62.2%)	121(78.6%)	1(2.4%)	1	96.043	0.000
	No	74(37.8%)	33(21.4%)	41(97.6%)			



Table 5: Bivariate analysis on Prescription review

Variable	Category	Frequency	Patient's view on prescription dispensing		Df	Chi square	P value
			Satisfied (n=154)	Unsatisfied (n=42)			
Patient dispensing history							
Treatment	New	168(85.7%)	129(83.8%)	39(92.9%)	1	2.227	0.136
	Switched	28(14.3%)	25(16.2%)	3(7.1%)			
Duplication	Yes	72(36.7%)	32(20.8%)	40(95.2%)	1	78.724	0.000
	No	124(63.3%)	122(79.2%)	2(4.8%)			
Possible drug interaction	Yes	38(19.4%)	0(0%)	38(90.5%)	1	172.844	0.000
	No	158(80.6%)	154(100%)	4(9.5%)			
Compliance issues	Yes	179(91.3%)	153(99.4%)	26(54.8%)	1	35.754	0.000
	No	20(8.7%)	1(0.6%)	19(45.2%)			
Misuse or abuse	Yes	47(24%)	5(3.2%)	42(100%)	1	169.462	0.000
	No	149(76%)	149(96.8%)	0(0%)			
Patient factors	Yes	181(92.3%)	153(99.4%)	19(45.2%)	1	92.323	0.000
	No	25(7.7%)	1(0.6%)	24(54.8%)			
Product selection							
Appropriate drug	Yes	188(95.9%)	154(100%)	34(81%)	1	27.899	0.000
	No	8(4.1%)	0(0%)	8(19%)			
Brand	Yes	162(82.7%)	152(98.7%)	10(23.8%)	1	133.741	0.000
	No	34(17.3%)	2(1.3%)	32(76.2%)			
Strength	Yes	190(96.9%)	154(100%)	36(85.7%)	1	22.695	0.000
	No	6(3.1%)	0(0%)	6(14.3%)			
Formulation	Yes	189(96.4%)	152(98.7%)	37(88.1%)	1	10.779	0.001
	No	7(3.6%)	2(1.3%)	5(11.9%)			
Quantity	Yes	191(97.4%)	154(100%)	37(88.1%)	1	18.813	0.000
	No	5(2.6%)	0(0%)	5(11.9%)			

Table 6: Bivariate analysis on Prepare, check, issue medicines and counseling

Variable	Category	Frequency	Patient's view on prescription dispensing		Df	Chi square	P value
			Satisfied (n=154)	Unsatisfied (n=42)			
Labeling							
Name of patient	Present	169(86.2%)	152(98.7%)	17(40.5%)	1	94.188	0.000
	Absent	27(13.8%)	2(1.3%)	25(59.5%)			
Generic name	Yes	124(63.3%)	119(77.3%)	5(11.9%)	1	60.674	0.000
	No	72(36.7%)	35(22.7%)	37(88.1%)			
Strength of drug	Present	134(68.4%)	128(83.1%)	6(14.3%)	1	72.294	0.000
	Absent	62(31.6%)	26(16.9%)	36(85.7%)			
Dosage instructions	Available	185(94.4%)	154(100%)	31(73.8%)	1	42.732	0.000
	Un available	11(5.6%)	0(0%)	11(26.2%)			
Duration of treatment	Provided	104(53.1%)	92(40.3%)	12(28.6%)	1	12.872	0.000
	Un provided	92(46.9%)	62(59.7%)	30(71.4%)			
Date of dispensing	Available	38(19.4%)	35(22.7%)	3(7.2%)	1	5.128	0.024
	Un available	158(80.6%)	119(77.3%)	39(92.9%)			
Name of dispensing institution	Indicated	49(25%)	49(31.8%)	0(0%)	1	17.818	0.000
	Not indicated	147(75%)	105(68.2%)	42(100%)			
Counseling aids	Present	25(12.8%)	25(16.2%)	0(0%)	1	7.815	0.005
	Absent	171(87.2%)	129(83.8%)	42(100%)			
Counseling							
Correct patient	Yes	175(89.3%)	154(100%)	21(50%)	1	86.24	0.000
	No	21(10.7%)	0(0%)	21(50%)			



Correct medicines	Yes	184(93.9%)	153(99.4%)	31(73.8%)	1	37.455	0.000
	No	12(6.1%)	1(0.6%)	11(26.2%)			
Documentations	Present	172(87.8%)	150(97.4%)	22(52.4%)	1	62.249	0.000
	Absent	24(12.2%)	4(2.6%)	20(47.6%)			
Storage / discard instructions	Yes	104(53.1%)	102(66.3%)	2(4.8%)	1	50.068	0.000
	No	92(46.9%)	52(33.7%)	40(95.2%)			
Patient instructions	Understood	98(50%)	90(58.4%)	8(19%)	1	20.485	0.000
	Not understood	98(50%)	64(41.6%)	34(81%)			
Patient clarifications	Answered	105(53.6%)	88(57.1%)	17(40.5%)	1	3.685	0.055
	Un answered	91(46.4%)	66(42.9%)	25(59.5%)			
Patient signature for supplied drugs	Present	25(12.8%)	12(7.8%)	13(31%)	1	15.906	0.000
	Absent	171(87.2%)	142(92.2%)	29(69%)			

Table 7: Multivariate logistic regression on rationale dispensing of antibiotics

Variable	Category	Patients views on dispensed antibiotics		AOR (CI 95%)		P value
		Satisfied (n=154)	Unsatisfied (n=42)			
Prescribers details	Satisfactory	164(83.7%)	152(98.7%)	0.067	(0.016,	0.000
	Unsatisfactory	32(16.3%)	2(1.3%)	0.286)		
Patient details	Satisfactory	175(89.3%)	150(97.4%)	0.222	(0.075,	0.000
	Unsatisfactory	21(10.7%)	4(2.6%)	0.662)		
Items dispensed	Clear	164(83.7%)	147(95.5%)	0.244	(0.105,	0.000
	Unclear	32(16.3%)	7(4.5%)	0.570)		
Legality						
Date	Yes	124(63.3%)	123(79.9%)	0.434	(0.266,	0.000
	No	72(36.7%)	31(20.1%)	0.708)		
Signature	Yes	148(75.5%)	146(94.8%)	0.169	(0.077,	0.000
	No	48(24.5%)	8(5.2%)	0.370)		
Safe dosing	Yes	148(75.5%)	147(95.5%)	0.147	(0.064,	0.000
	No	48(24.5%)	7(4.5%)	0.335)		
Contraindications	Yes	122(62.2%)	121(78.6%)	0.450	(0.278,	0.000
	No	74(37.8%)	33(21.4%)	0.728)		
Duplication	Yes	72(36.7%)	32(20.8%)	2.214	(1.362,	0.000
	No	124(63.3%)	122(79.2%)	3.598)		
Possible drug interaction	Yes	38(19.4%)	0(0%)	1.975	(1.77,	0.000
	No	158(80.6%)	154(100%)	2.203)		
Compliance issues	Yes	179(91.3%)	153(99.4%)	0.058	(0.008,	0.000
	No	20(8.7%)	1(0.6%)	4.41)		
Misuse or abuse	Yes	47(24%)	5(3.2%)	9.4	(3.637,	0.000
	No	149(76%)	149(96.8%)	24.294)		
Patient factors	Yes	181(92.3%)	153(99.4%)	0.047	(0.006,	0.000
	No	25(7.7%)	1(0.6%)	0.353)		
Appropriate drug	Yes	188(95.9%)	154(100%)	0.55	(0.499,	0.000
	No	8(4.1%)	0(0%)	0.605)		
Brand	Yes	162(82.7%)	152(98.7%)	0.063	(0.015,	0.000
	No	34(17.3%)	2(1.3%)	0.265)		
Strength	Yes	190(96.9%)	154(100%)	0.552	(0.502,	0.000
	No	6(3.1%)	0(0%)	0.607)		
Formulation	Yes	189(96.4%)	152(98.7%)	0.355	(0.073,	0.001
	No	7(3.6%)	2(1.3%)	1.735)		
Quantity	Yes	191(97.4%)	154(100%)	0.554	(0.504,	0.000
	No	5(2.6%)	0(0%)	0.609)		



Table 7: Multivariate logistic regression on rationale dispensing of antibiotics

Variable	Category	Patients views on dispensed antibiotics		AOR (CI 95%)	P - value
		Satisfied (n=154)	Unsatisfied (n=42)		
Name of patient	Present	169(86.2%)	152(98.7%)	0.82 (0.019, 0.352)	0.000
	Absent	27(13.8%)	2(1.3%)		
Generic name	Yes	124(63.3%)	119(77.3%)	0.507 (0.315, 0.815)	0.000
	No	72(36.7%)	35(22.7%)		
Strength of drug	Present	134(68.4%)	128(83.1%)	0.439 (0.262, 0.737)	0.000
	Absent	62(31.6%)	26(16.9%)		
Dosage instructions	Available	185(94.4%)	154(100%)	0.546 (0.495, 0.601)	0.000
	Un available	11(5.6%)	0(0%)		
Duration of treatment	Provided	104(53.1%)	92(40.3%)	0.762 (0.497, 1.168)	0.000
	Un provided	92(46.9%)	62(59.7%)		
Date of dispensing	Available	38(19.4%)	35(22.7%)	0.818 (0.488, 1.372)	0.024
	Un available	158(80.6%)	119(77.3%)		
Name of dispensing institution	Indicated	49(25%)	49(31.8%)	0.714 (0.447, 1.141)	0.000
	Not indicated	147(75%)	105(68.2%)		
Counseling aids	Present	25(12.8%)	25(16.2%)	0.754 (0.414, 1.374)	0.005
	Absent	171(87.2%)	129(83.8%)		
Counseling					
Correct patient	Yes	175(89.3%)	154(100%)	0.532 (0.481, 0.589)	0.000
	No	21(10.7%)	0(0%)		
Correct medicines	Yes	184(93.9%)	153(99.4%)	0.1 (0.013, 0.774)	0.000
	No	12(6.1%)	1(0.6%)		
Documentations	Present	172(87.8%)	150(97.4%)	0.191 (0.065, 0.563)	0.000
	Absent	24(12.2%)	4(2.6%)		
Storage / discard instructions	Yes	104(53.1%)	102(66.3%)	0.576 (0.373, 0.891)	0.000
	No	92(46.9%)	52(33.7%)		
Patient instructions	Understood	98(50%)	90(58.4%)	0.711 (0.465, 1.088)	0.000
	Not understood	98(50%)	64(41.6%)		
Patient signature for supplied drugs	Present	25(12.8%)	12(7.8%)	1.73 (0.839, 3.566)	0.000
	Absent	171(87.2%)	142(92.2%)		

DISCUSSION

Before filing a prescription, it is important to undertake a good scrutiny for possibility of any errors. The study findings show that the patient (89.3%) and prescribers name and address (83.7%) were well captured followed by prescriber signature (75.3%), safe dosing (75.5%), prescription date (63.3%), cautionary information (62.2%) and stamp (38.5%). The patient condition or disease (29.6%) being managed was the rarely documented in most prescriptions dispensed. Bivariate analysis findings show that all prescription legality or validity parameters were statistically significant except prescription stamp and condition or disease being managed. Similar findings were recorded by Etsengent and Anbessa (2013) with 67.3% unclear prescriptions.

On prescription review, the pharmacists or pharmaceutical technologists found out about 36.7% duplication in prescription writing, 19.4% possible drug interactions, 24% suspected cases of antibiotic misuse or abuse and 92.3% of all the prescriptions has taken into consideration the patient factors (age, allergy and pregnancy). However, on the negative side,

about 82.7% of the prescribed drugs were written using the brand names. All the variables in prescription review were statistically significant except treatment (p=0.136). Contrary, Etsengent and Anbessa (2013) study recorded 17.4% drugs prescribed using brand names though this study was carried out in a hospital environment.

WHO advocates that rationale dispensing principles should be followed all times to ensure that the patient receives adequate information regarding use of dispensed medicines in order to achieve desired benefits (WHO, 2016). All dispensed drugs were labeled but the information in varied. About 63.3% of drug names were written using generic, with 68.4% showing clear strength of the drug, 53.1% showing the duration of treatment, 25% showing the dispensing facility name and address, 12.8% could display counseling aids, 53.1% show the storage temperature and drug discarding method. Study by Tadele and Genet (2018) findings show about 66.6% of dispensed antibiotics had been clearly labeled and Etsengent and Anbessa (2013) show about 60.9% dispensed antibiotic were



having wrong label information. According to Tadele and Genet (2018), the drug labels content had patient name 33.2%, precautions 6.6%, storage environment 26.6% and duration of treatment 80%.

About 50% of patients who had received antibiotics could clearly recall all the information they had been given during dispensing and 79% were satisfied with dispensing services they had gotten. Similar findings were recorded by Nyiligira (2009) findings on patient satisfaction with dispensing service given. Multivariate logistic regression findings show drug misuse or abuse (AOR 9.4; CI 3.637, 24.294)

CONCLUSIONS

A number of prescriptions were reported to missing prescription date, stamp, indication of the managed disease as well as cautionary information making them have errors or omissions

There are several prescriptions with duplication of the prescribed drugs suggesting a prescription pattern by the prescribers to market specific products which is an indicator of antibiotic misuse or abuse

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Majority of persons were satisfied with dispensing techniques (scrutiny, prescription review, filing of the prescription, issue and counseling provided to them) which is a good gesture from the pharmacists and pharmaceutical technologists.

Recommendations

The study recommends on the following;

1. The prescribers should always adhere to prescribing guidelines in order to enhance validity and legality of their prescriptions. This can be empowered by having joined continuous medical education
2. The prescribers should always stick to prescription guidelines on appropriate diagnosis, appropriate drug and appropriate patient in order to limit any likelihood of drug misuse or abuse
3. The pharmacists and pharmaceutical technologists should always not assume provided their patients with neat, clear and elaborate drug labels because it can reduce any likely mistakes and promote appropriate drug use

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