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Antibiotic Prescribing Pattern On Dispensed Prescriptions At The Community Pharmacies Outlets In Kenya

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Abstract
Prescription writing is a legal process where a qualified medical practitioner gives instruction for compounding or issuance of certain medicines to the patients with certain instructions. Certain protocols should be followed in prescribing antibiotics in order to enhance compliance, provide curative services on infections as well as reduce cases of resistance. The objective of this study was to determine the rationality of prescriptions received in various community pharmacy outlets in Mombasa County. This was realized by doing an assessment on the criteria used in diagnosis, choice for antibiotics, legality of the prescription and monitoring of prescribed medicines. The study employed a descriptive cross sectional study design. A snowball sampling technique was used to collect data from the community pharmacy outlets. A checklist was designed to obtain data from filed prescription with antibiotics at the pharmacies as well as interview carried out on the pharmacies and pharmaceutical technologists. A sample size of 196 was calculated using Mugenda formula. The collected data was cleaned then entered into a computer package (SPSS version 21) for analysis and interpreted using tables and charts. The consent to collect data was sought from the community pharmacies directors and ethical considerations adhered to. About 74.4% of the respondents were male (p= 0.002), about 63.7% of incomplete prescriptions were coming from male prescribers (p=0.000) and clinical officers common prescribers (55.4%) and had the highest omissions on the prescriptions (p= 0.001). on the legality of the prescription; prescriber characteristics (p= 0.000), prescription characteristics (p= 0.000), appropriate drug (p= 0.000) and monitoring of appropriate drug (p= 0.000) being statistically significant. The study findings on multivariate logistic regression show that drug efficacy (AOR 1872; CI 189.192, 18522) and drugs pharmacodynamics (AOR 148; CI 42.010, 225.213). The study recommends that all prescribers adhere to appropriate prescribing techniques of appropriate diagnosis, legality of the prescription, appropriate drug selection and monitoring to prescribed antibiotics for better treatment outcomes.

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I. Introduction

Prescription writing is a science and an art, as it conveys the message from the prescriber to the patient (Maxwel, 2009). Inappropriate drug prescribing is a global problem (Scott and Terner, 1994). The irrational use of drugs is a major problem of present day medical practice and its consequences include ineffective treatment, unnecessary prescription of drugs-particularly antimicrobials and injections, development of resistance to antibiotics, adverse effects and economic burden on patients and the society (Salman *et al*, 2008).

The five important criteria for rational drug use are accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence (Ching and Shihara, 2010). The assessment of medicine utilization is important for clinical, educational and economic purposes. Rational prescribing forms the corner stone of successful implementation of the rational use of drugs (Barber, 1995). The study of prescribing patterns seeks to monitor, evaluate and if necessary, suggest modifications in prescribing patterns so as to make medical care rational and cost effective (De Verie *et al*; 1994).

Overprescribing injections is a common type of inappropriate medicine use. The use of injections for treatment is accompanied by a variety of disadvantages including sepsis at administration site, abscesses, the risk of tissue toxicity and nerve damage from local irritation, increased risk of infection transmission including hepatitis B and HIV (De Verie, 1993). Injections are also costly since they require additional expenses such as needles and syringes, thus WHO recommends that less than 10% prescriptions should include one or more injections (WHO, 2011).

Since antimicrobial chemotherapy was introduced in medical practice, there have been calls for its rational use. Appropriate antimicrobial treatment greatly improves the prognosis of infectious diseases (Sivagnanam *et al*; 2008). There has been a very significant reduction in morbidity and mortality associated with the use of antimicrobials since they were first introduced (WHO, 1995). However, the overuse of antimicrobials may increase the risks of drug resistant pathogens, side effects and costs of medical care (Horgerzeile, 1995).

The right agent at the right dose and dosing interval and right duration can achieve both a favorable clinical outcome and prevent the selection of resistance. It was reported that 20–50% of antimicrobial use in humans was questionable or inappropriate (Hamilton *et al*; 2009).

The use of generic name contributes to cost reduction and provides more alternatives for drug purchases. The use of brand names also has consequences for communication between physicians. Confusion over drug terminology can result in adverse drug events (KEDL, 2003). For example, a patient may inadvertently be given a second formulation of a drug because the prescribing physician failed to recognize that the patient was already taking the medication under a different name. The use of nonproprietary terminology in medicine should be encouraged to save costs, limit commercial influence, and reduce the potential for prescribing errors (Gwimile *et al*; 2012).A combination of health-care provider education and supervision, consumer education, and an adequate medicines supply is effective in improving the use of medicines, while any of these interventions alone has limited impact. Rational use of drugs requires that patients receive the appropriate medicine, in the proper dose, for an adequate period of time, and at the lowest cost to them and their community (WHO, 1995).

The research study design

The study employed a descriptive cross sectional study. Descriptive cross sectional study inspects the prevalence of a disease or condition in a defined population at a specific point or period in time without attempting to draw any inferences or offer any causes for the prevalence.

The study was carried out in selected community pharmacy outlets in Mombasa County. Mombasa is one of the oldest towns in the Kenyan coastal region and the smallest county (in size) in Kenya. The county has an approximate 500 community pharmacy outlets within the island. The study population was the pharmacist and pharmaceutical working in those laboratories. The subjects were interviewed and as well data secondary data obtained from filed antibiotic prescription in the pharmacies

A snowball non probability sampling was used to recruit the subjects in the community pharmacies within the island. The inclusion criteria was all community pharmacies that had renewed practicing license for the year 2021 with pharmacies or pharmaceutical technologist enrolled with the pharmacy and poisons board and were willing to participate via consenting. A sample size of 196 was calculated using the fisher'*set al* formula. Data was collected via conducting interviews to the pharmacist and pharmaceutical technologist and well as collecting secondary data from filed antibiotic prescriptions using designed checklist. All collected was edited, entered into a computer soft ware (SPSS version 21) for analysis and presented using tables and pie charts.

II. Results:

Table 1: Demographic factors

Variable	Category	Frequency
Patient information		
Sex	Male	102(52%)
	Female	94(48%)
Age	20-40 years	122(62.2%)
	>40 years	74(37.8%)
Disease or infection	New	158(80.6%)
	Relapse or Chronic	38(19.4%)
Prescriber information		
Sex	Male	137(69.9%)
	Female	59(30.1%)
Cadre	Clinical officer	117(59.7%)
	Medical officer / dentist	50(25.5%)
	Others (nurse)	29(14.8%)

Infection investigation criteria

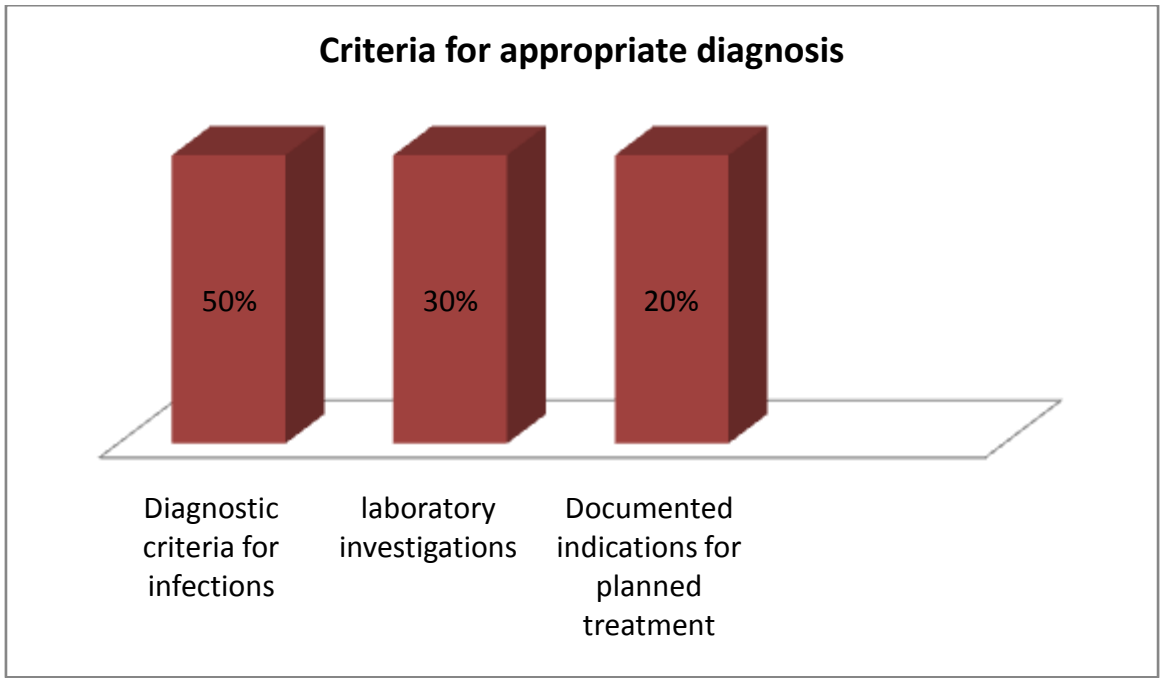

Figure 1: Appropriate infection investigation

Table 2: Legality of the prescription

Variable	Category	Frequency (%)
Prescriber characteristics		
Name	Provided	154(78.6%)
	Omitted	42(21.4%)
Address	Provided	114(58.2%)
	Omitted	82(41.8%)
Signature	Provided	125(63.8%)
	Omitted	71(36.2%)
Patient characteristics		
Name	Provided	158(80.6%)
	Omitted	83(19.4%)
Address	Provided	15(7.7%)
	Omitted	181(92.3%)
Age / weight	Provided	118(60.2%)
	Omitted	78(39.8%)
Diagnosis	Provided	12(6.1%)
	Omitted	184(93.9%)
Prescription characteristics		
Date	Provided	92(46.9%)
	Omitted	104(53.1)
Drug name	Provided	157(80.1%)
	Omitted	39(19.9%)
Formulation	Provided	122(62.2%)
	Omitted	74(37.8%)
Strength	Provided	179(91.3%)
	Omitted	17(8.7%)
Dose of frequency	Provided	188(95.9%)
	Omitted	8(4.1%)
Duration of treatment	Provided	190(96.9%)
	Omitted	6(3.1%)
Cautionary information	Provided	128(65.3%)
	Omitted	65(34.7%)

Table 3: Appropriate drug

Variable	Category	Frequency
Prescriptions		
With antibiotics	Yes	154(78.6%)
	No	42(21.4%)
Number of antibiotics	1	127(64.8%)
	>1	69(35.2%)
Formulation	Per orals	173(88.3%)

		Injections	23(11.7%)
	Drug names (generics)	Yes	149(76%)
		No	47(24%)
	EDL Guidelines	Yes	159(81.1%)
		No	37(18.9%)
Drugs			
	Suitability	Very good	184(93.9%)
		Good	12(6.1%)
	Efficacy	Very good	188(95.9%)
		Good	8(4.1%)
	Safety	Very good	189(94.4%)
		Good	7(5.6%)
	Cost	Very good	78(39.8%)
		Good	118(60.2%)

Commonly prescribed antibiotics

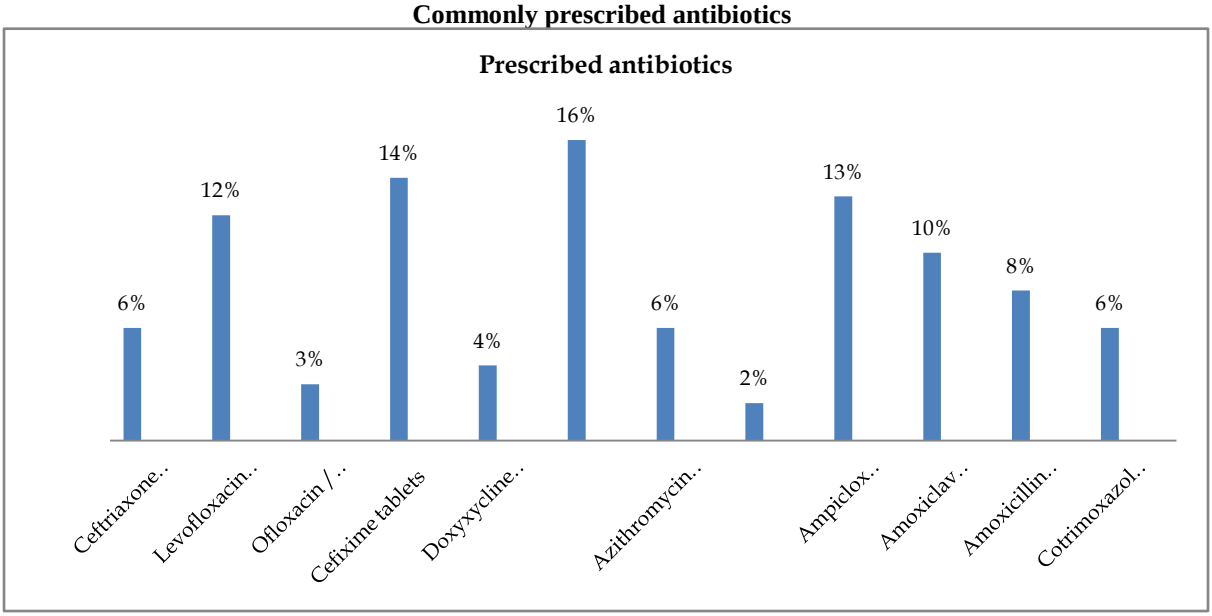

Figure 2:Commonly prescribed antibiotics

Common bacterial infections

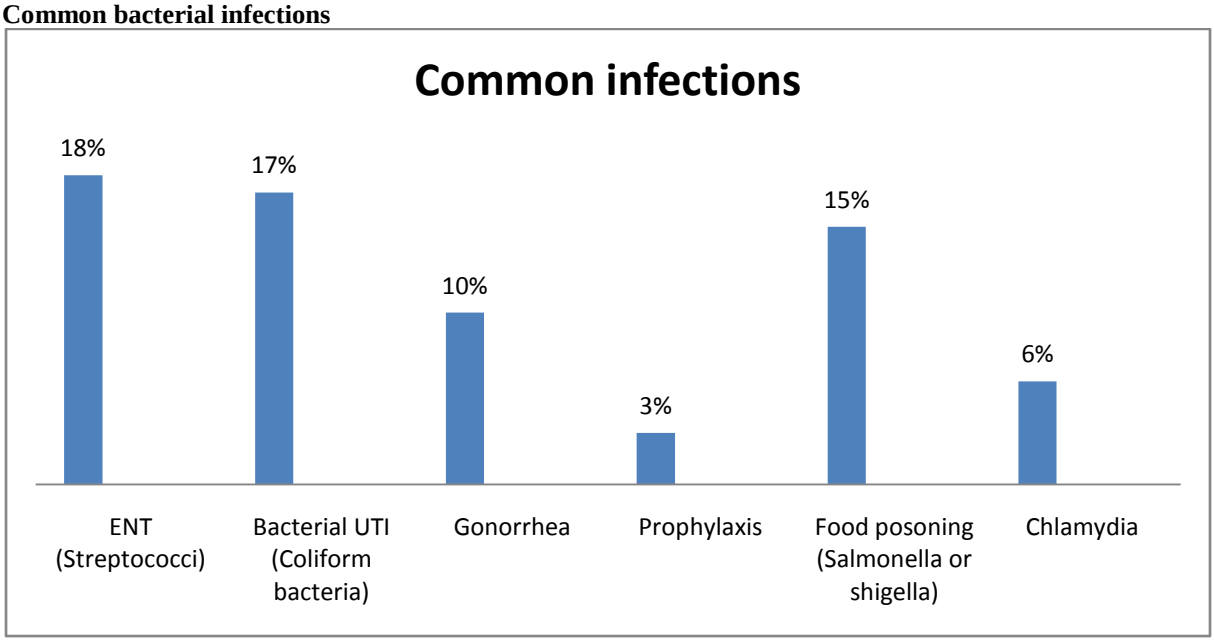

Figure 3:Commonly diagnosed bacterial infections

Table 4: Appropriate information and monitoring

Variable	Category	Frequency
Drug factors		
Safety	Verified	157(80.1%)
	Omitted	39(19.9%)
Efficacy	Verified	159(81.1%)
	Omitted	37(18.9%)
Pharmacokinetics	Verified	159(91.3%)
	Omitted	17(8.7%)
Pharmacodynamics	Verified	161(82.1%)
	Omitted	35(17.9%)
Patients factors (Physiological)		
Pregnancy	Verified	160(81.6%)
	Omitted	36(18.4%)
Kidney failure	Verified	157(80.1%)
	Omitted	39(19.9%)
A/E's susceptibility	Verified	174(88.8%)
	Omitted	22(11.2%)
Monitoring		
Adherence	Verified	128(65.3%)
	Omitted	68(34.7%)
A/E's	Verified	184(93.9%)
	Omitted	12(6.1%)
Drug resistance	Verified	190(96.9%)
	Omitted	6(3.1%)

Table 5: Bivariate analysis onSocio demographic factors

Variable	Drug monitoring safety		Df	Chi square	P value
	Assured (n=157)	Omitted (n=39)			
Patient information					
Sex					
Male	73(46.5%)	29(74.4%)	1	9.717	0.002
Female	84(53.5%)	10(25.6%)			
Age					
20-40 years	100(63.7%)	22(56.4%)	1	0.705	0.401
>40 years	57(36.3%)	17(43.6%)			
Disease or infection					
New	122(77.7%)	36(92.3%)	1	4.26	0.039
Relapse or Chronic	35(22.3%)	3(7.7%)			
Prescriber information					
Sex					
Male	100(63.7%)	37(94.9%)	1	14.432	0.000
Female	57(36.3%)	2(5.1%)			
Cadre					
Clinical officer	87(55.4%)	30(76.9%)	1	13.546	0.001
Medical officer / dentist	49(31.2%)	1(2.6%)			
Others (nurse)	21(13.4%)	8(20.5%)			

Table 6: Bivariate analysis on legality of prescription

Variable	Category	Drug monitoring safety		Df	Chi square	P value
		Assured (n=157)	Assured (n=39)			
Prescriber characteristics						
Name	Provided	152(96.8%)	2(5.1%)	1	155	0.000
	Omitted	5(3.2%)	37(94.9%)			
Address	Provided	111(70.7%)	3(7.7%)	1	50.968	0.000
	Omitted	46(29.3%)	36(92.3%)			
Signature	Provided	120(76.4%)	5(12.8%)	1	50.719	0.000
	Omitted	37(23.6%)	34(87.2%)			
Patient characteristics						
Name	Provided	155(98.7%)	3(7.7%)	1	165.648	0.000
	Omitted	2(1.3%)	36(92.3%)			
Address	Provided	12(7.6%)	3(7.7%)	1	0	0.992
	Omitted	145(92.4%)	36(92.3%)			
Age / weight	Provided	116(73.9%)	2(5.1%)	1	61.642	0.000
	Omitted	41(26.1%)	37(94.9%)			
Diagnosis	Provided	10(6.4%)	2(5.1%)	1	0.0841	0.772
	Omitted	147(93.6%)	37(94.9%)			
Prescription characteristics						
Date	Provided	85(54.1%)	7(17.9%)	1	16.429	0.000
	Omitted	72(45.9%)	32(82.1%)			
Drug name	Provided	157(100%)	0(0%)	1	196	0.000

	Omitted	0(0%)	39(100%)			
Formulation	Provided	117(74.5%)	5(12.8%)	1	50.609	0.000
	Omitted	40(25.5%)	34(87.2%)			
Strength	Provided	155(98.7%)	24(61.5%)	1	54.54`	0.000
	Omitted	2(1.3%)	15(38.5%)			
Dose of frequency	Provided	154(98.1%)	34(87.2%)	1	9.497	0.002
	Omitted	3(1.9%)	5(12.8%)			
Duration of treatment	Provided	157(100%)	33(84.6%)	1	24.97	0.000
	Omitted	0(0%)	6(15.4%)			
Cautionary information	Provided	122(77.7%)	6(15.4%)	1	53.554	0.000
	Omitted	35(22.3%)	33(84.6%)			

Table 7: Bivariate analysis on appropriate drug

Variable	Category	Drug monitoring safety		Df	Chi square	P value
		Assured (n=157)	Omitted (n=39)			
Prescriptions						
With antibiotics	Yes	154(98.1%)	0(0%)	1	178.522	0.000
	No	3(1.9%)	39(100%)			
Number of antibiotics	1	119(75.8%)	8(20.5%)	1	41.856	0.000
	>1	38(24.2%)	31(79.5%)			
Formulation	Per orals	153(97.5%)	20(51.3%)	1	64.294	0.000
	Injections	4(2.5%)	19(48.7%)			
Drug names (generics)	Yes	149(94.9%)	0(0%)	1	154.351	0.000
	No	8(5.1%)	39(100%)			
EDL Guidelines	Yes	157(100%)	2(5.1%)	1	183.61	0.000
	No	0(0%)	37(94.9%)			
Drugs						
Suitability	Very good	152(96.8%)	32(82.1%)	1	11.848	0.001
	Good	5(3.2%)	7(17.9%)			
Efficacy	Very good	157(100%)	31(79.5%)	1	33.576	0.000
	Good	0(0%)	8(20.5%)			
Safety	Very good	155(98.7%)	34(87.2%)	1	12.094	0.001
	Good	2(1.3%)	5(12.8%)			
Cost	Very good	69(43.9%)	9(23.1%)	1	5.680	0.017
	Good	88(56.1%)	30(76.9%)			

Table 8: Bivariate analysis on appropriate information and monitoring

Variable	Category	Drug monitoring safety		Df	Chi square	P value
		Assured (n=157)	Omitted (n=39)			
Drug factors						
Safety	Verified	157(100%)	0(0%)	1	196	0.000
	Omitted	0(0%)	39(100%)			
Efficacy	Verified	156(99.4%)	3(7.7%)	1	171.429	0.000
	Omitted	1(0.6%)	36(92.3%)			
Pharmacokinetics	Verified	155(98.7%)	24(61.5%)	1	54.54	0.000
	Omitted	2(1.3%)	15(38.5%)			
Pharmacodynamics	Verified	153(97.5%)	8(10.5%)	1	126.074	0.000
	Omitted	4(2.5%)	31(79.5%)			
Patients factors (physiological)						
Pregnancy	Verified	157(100%)	3(7.7%)	1	177.531	0.000
	Omitted	0(0%)	36(92.3%)			
Kidney failure	Verified	157(100%)	0(0%)	1	196	0.000
	Omitted	0(0%)	39(100%)			
A/E's susceptibility	Verified	147(93.6%)	27(69.2%)	1	18.665	0.000
	Omitted	10(6.4%)	12(30.8%)			
Monitoring						
Adherence	Verified	124(79%)	4(10.3)	1	59.782	0.000
	Omitted	33(21%)	35(89.7%)			
A/E's	Verified	151(96.2%)	33(84.6%)	1	7.267	0.000
	Omitted	6(3.8%)	6(15.4%)			
Drug resistance	Verified	157(100%)	33(84.6%)	1	24.917	0.000
	Omitted	0(0%)	6(15.4%)			

Table 9: Multivariate logistic regression on drug monitoring safety

Variable	Category	Drug monitoring safety		AOR (CI 95%)	P - value
		Assured (n=157)	Assured (n=39)		
Sex	Male	73(46.5%)	29(74.4%)	0.300 (0.137, 0.656)	0.002
	Female	84(53.5%)	10(25.6%)		
Disease or infection	New	122(77.7%)	36(92.3%)	0.29 (0.084, 1)	0.039
	Relapse or Chronic	35(22.3%)	3(7.7%)		
Prescriber information (sex)	Male	100(63.7%)	37(94.9%)	0.095 (0.022, 0.408)	0.000
	Female	57(36.3%)	2(5.1%)		
Cadre	Clinical officer	87(55.4%)	30(76.9%)	-	0.001
	Medical officer /dentist	49(31.2%)	1(2.6%)		
	Others (nurse)	21(13.4%)	8(20.5%)		
Prescriber characteristics					
Name	Provided	152(96.8%)	2(5.1%)	56.2 (104.9, 3013.745)	0.000
	Omitted	5(3.2%)	37(94.9%)		
Address	Provided	111(70.7%)	3(7.7%)	28.957 (8.49, 60.462)	0.000
	Omitted	46(29.3%)	36(92.3%)		
Signature	Provided	120(76.4%)	5(12.8%)	22.054 (8.044, 60.462)	0.000
	Omitted	37(23.6%)	34(87.2%)		
Patient characteristics					
Name	Provided	155(98.7%)	3(7.7%)	930 (149.847, 5771.889)	0.000
	Omitted	2(1.3%)	36(92.3%)		
Age / weight	Provided	116(73.9%)	2(5.1%)	52.341 (12.074, 12.959)	0.000
	Omitted	41(26.1%)	37(94.9%)		
Prescription characteristics					
Date	Provided	85(54.1%)	7(17.9%)	5.397 (2.247, 12.959)	0.000
	Omitted	72(45.9%)	32(82.1%)		
Drug name	Provided	157(100%)	0(0%)	-	0.000
	Omitted	0(0%)	39(100%)		
Formulation	Provided	117(74.5%)	5(12.8%)	19.89 (7.28, 53.341)	0.000
	Omitted	40(25.5%)	34(87.2%)		
Strength	Provided	155(98.7%)	24(61.5%)	48.438 (10.42, 225.28)	0.000
	Omitted	2(1.3%)	15(38.5%)		
Dose of frequency	Provided	154(98.1%)	34(87.2%)	7.549 (1.721, 33.121)	0.002
	Omitted	3(1.9%)	5(12.8%)		
Duration of treatment	Provided	157(100%)	33(84.6%)	0.174 (0.127, 0.237)	0.000
	Omitted	0(0%)	6(15.4%)		
Cautionary information	Provided	122(77.7%)	6(15.4%)	19.171 (7.432, 49.452)	0.000
	Omitted	35(22.3%)	33(84.6%)		

Table 9: Multivariate logistic regression on drug monitoring safety (continuation)

Variable	Category	Drug monitoring safety		AOR (CI 95%)	P - value
		Assured (n=157)	Assured (n=39)		
Prescriptions with antibiotics	Yes	154(98.1%)	0(0%)	14 (4.705, 41.657)	0.000
	No	3(1.9%)	39(100%)		
Number of antibiotics	1	119(75.8%)	8(20.5%)	12.135 (5.141, 28.641)	0.000
	>1	38(24.2%)	31(79.5%)		
Formulation	Per orals	153(97.5%)	20(51.3%)	86.358 (11.226, 117.62)	0.000
	Injections	4(2.5%)	19(48.7%)		
Drug names (generics)	Yes	149(94.9%)	0(0%)	5.875 (3.125, 11.045)	0.000
	No	8(5.1%)	39(100%)		
EDL Guidelines	Yes	157(100%)	2(5.1%)	0.013 (0.003,0.50)	0.000
	No	0(0%)	37(94.9%)		
Suitability	Very good	152(96.8%)	32(82.1%)	6.65 (1.984, 22.285)	0.001
	Good	5(3.2%)	7(17.9%)		
Efficacy	Very good	157(100%)	31(79.5%)	0.165 (0.12, 0.227)	0.000
	Good	0(0%)	8(20.5%)		
Safety	Very good	155(98.7%)	34(87.2%)	11.397 (2.121, 61.231)	0.001
	Good	2(1.3%)	5(12.8%)		
Cost	Very good	69(43.9%)	9(23.1%)	2.614 (1.164, 5.868)	0.017
	Good	88(56.1%)	30(76.9%)		
Safety	Verified	157(100%)	0(0%)	-	0.000
	Omitted	0(0%)	39(100%)		
Efficacy	Verified	156(99.4%)	3(7.7%)	1872 (189.192, 18522.918)	0.000
	Omitted	1(0.6%)	36(92.3%)		
Pharmacokinetics	Verified	155(98.7%)	24(61.5%)	48.438 (10.418, 225.213)	0.000
	Omitted	2(1.3%)	15(38.5%)		
Pharmacodynamics	Verified	153(97.5%)	8(10.5%)	148.219	0.000

	Omitted	4(2.5%)	31(79.5%)	(42.010, 522.943)	
Pregnancy	Verified	157(100%)	3(7.7%)	0.019 (0.006,	0.000
	Omitted	0(0%)	36(92.3%)	0.058)	
Kidney failure	Verified	157(100%)	0(0%)	-	0.000
	Omitted	0(0%)	39(100%)		
A/E's susceptibility	Verified	147(93.6%)	27(69.2%)	6.533 (2.567,	0.000
	Omitted	10(6.4%)	12(30.8%)	16.628)	
Adherence	Verified	124(79%)	4(10.3)	32.879 (10.907,	0.000
	Omitted	33(21%)	35(89.7%)	99.110)	
A/E's	Verified	151(96.2%)	33(84.6%)	4.576 (1.388,	0.000
	Omitted	6(3.8%)	6(15.4%)	15.080)	
Drug resistance	Verified	157(100%)	33(84.6%)	0.177 (0.127,	0.000
	Omitted	0(0%)	6(15.4%)	0.237)	

III. Discussion

From the socio demographic characteristics, about 69.9% of patient respondents were male and about 63.7% of the prescribers were male. The clinical officers were the highest prescribers (59.7%) followed by the medical officers / dentist (25.5%).There were three criteria used for appropriate diagnosis namely use of diagnostic criteria information (50%), use of laboratory investigations (30%) and use of documented investigation guidelines (20%). Based on bivariate analysis, the patient gender (p=0.002), prescribers gender (0.000) and cadre (0.001) were statistically significant.

A legal prescription portray the name and address of the patient, as well as the prescriber, drug name, strength and instruction for use as well as prescription date. The sampled prescriptions show the following findings, date (46.9%), drug name (80.1%), strength (91.3%), duration of treatment (96.9%) and cautionary information (65.3%). On the prescriber's characteristics, address was least provided (58.2%) as well as patient address (7.7%). Most prescriptions miss to capture the disease being managed or treatment plan (6.1%). Bivariate findings shows that prescribers details (p=0.000), patients age / weight (p=0.000) and prescription characteristics (date, drug name, formulation, strength, dose frequency, duration of treatment and cautionary information) being statistically significant. These findings are still below the WHO guidelines on good prescribing (WHO, 2011 and KEDL, 2003) whose recommendations are on 100% legality of prescriptions. The percentage of drugs prescribed by generic name was80.1% which is similar to results from Tanzania (82%), Uganda (86%) and Zimbabwe(94%). But contrary to a survey carried out in a tertiary health facility in Kenya, 40% generic prescribing was reported (Shah, 2007) but still low to WHO optimal index of 100% (Hogerzeil *et al*; 1993)

There common bacterial infections seen were ENT (*Streptococci*) 18%, bacterial UTI (*Coliform bacteria*) 17%, food poisoning (*Salmonella* / *Shigella*) 15%, Gonorrhea 10% and Chlamydia 6% while the commonly used antibiotics were Amoxicillin 500mg capsules (16%), Ampiclox 500mg capsules (13%), Cefixime 400mg tablets (14%), Levofloxacin 500mg tablets (12%) and Amoxiclav 1g tablets (10%). Injectable antibiotics were least used (11.7%). From all sampled prescriptions; about 78.6% had an antibiotic prescribed and 32.5% had more than one antibiotic being prescribed. About 76% of the prescriptions used generic names and 81.1% followed EDL guidelines in prescribing. Bivariate analysis findings show that use of drug generic name (p=0.000), adherence to EDL guidelines (p=0.000) as well as choosing an appropriate drug with good efficacy (p=0.000) and safety (p=0.001) being statistically significant. The prescription of antibiotics was higher compared to Uganda (53%), Swaziland (54%), Jordan (60.9%) and Sudan (63%). WHO advocates that encounters with antibiotics prescribed should be less than 30% for it to be considered rational (Gwimile *et al*; 2012, Okeke *et al*; 1999 and Sivagnanam *et al*; 2004).

The choice of antibiotics should be influenced by drug factors (safety, efficacy, pharmacokinetics and pharmacodynamics), patient factors (pregnancy, kidney functions and adverse events susceptibility) and monitoring (adherence, adverse effects and drug resistance). The bivariate analysis found out that patient physiological factors (p=0.000), adverse events susceptibility (p=0.000), adherence (p=0.000), adverse effects (p=0.000) as well as drug resistance (p=0.000) to be statistically significant. The multivariate logistic regression show that drug efficacy (AOR 1872; CI 189.192, 18522) and drugs pharmacodynamics (AOR 148; 42.010, 225.213).

IV. Conclusion

The overall study findings show prescribing patterns were in line with the provided guidelines. However, there still prescription errors and omissions by the prescribers as well as use trade names in prescribing of antibiotics. This can be improved via continuous medical education strategies to the prescribers. The high rate of antibiotic 78.6% antibiotic prescription was because the study was targeting antibiotic prescriptions at the community pharmacies

Recommendations

The study recommends on the following

1. All prescribers adhere to appropriate prescribing techniques of appropriate diagnosis
2. The prescribers should always observe the legality of the prescription, appropriate drug selection and monitoring to prescribed antibiotics for better treatment outcomes
3. All prescribed antibiotics should be monitored in order to check on appropriate drug use by the patient

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