ASSESSMENT OF DISPENSING PRACTICE OF ANTIBIOTICS IN THE SELECTED COMMUNITY PHARMACIES: A PROSPECTIVE STUDY

Abstract

Introduction:
Dispensing is the provision of drugs as set out correctly on a lawful prescription by the pharmacist/Healthcare professional doctor. The over-the-counter sale of antibiotics is a global problem. Antibiotics are very commonly prescribed and dispensed for patients in pharmacies, and it is increasingly recognized as antibiotic misuse. This misuse may increase the treatment cost and the development of antimicrobial resistance. Therefore, an assessment of dispensing patterns of antibiotics is essential to know the standard of pharmacy practice and prevent unnecessary antimicrobial resistance.

OBJECTIVES:
To categorize the class of antibiotics used in the various diseases, check for the appropriateness of the antibiotics observed in the prescription, and understand the pattern of dispensing of antibiotics.

METHODS:
A community-based- a cross-sectional observational study was carried out for six months in Selected community pharmacies in Kumaraswamy Layout, Kengeri Bengaluru, Gubbi Tumkur District, Ballari Karnataka, SrikalahastiAndhra Pradesh. Document The information collected in the data collection form. PIL has been distributed to the study subjects. The data were analyzed using descriptive analysis.

Results: Among 26 pharmacy visits and 538 cases, 393(73%) were dispensed by D pharm graduates, 63(11.7%) BA graduates. 355(66%) were administered with a prescription, and 183 (34%) were dispensed without a prescription. The highly distributed brand was Spectratil 46 (8.6%), Macrobid 26(4.8%), Mahacef 24(4.4%) and Augmentin 18(3.4%), and the least dispensed brand was Q max 1(0.2%), OFM 1(0/2%). Most of the antibiotics administered were for cough and fever 222 (41.3%) and toothache 85 (15.8%). Study subjects who Had not heard about antibiotics were 461(85.7%), and 77(14.3) knew about antibiotics. 308(57.2%) said they could stop antibiotics after completing the course, and 193(35.9%) said antibiotics could be stopped when the patient felt better. Among 26 pharmacy visits, 440(81.8%) agreed that pharmacists should not dispense antibiotics without a valid prescription, and 344(64.9%) dispense antibiotics both by self-knowledge and request by the patient. 532(98.9%) know about schedule H1, and 512(95.2%) follow the Schedule H1 act. Among 538 study subjects, 406(75.5%) accepted the PIL, whereas 122(22.7%) denied the PIL, and 10(1.9%) pharmacists did not permit us to distribute PIL.

Conclusion: All registered pharmacists must hold an essential pharmacy degree—regulatory authorities implementation of regulations strictly. Physicians should charge minimal consultation fees, reducing the count of patients approaching the pharmacy without a prescription. In addition,

continuous education to physicians and pharmacists to increase awareness about the emergence of antibiotic resistance plays a vital role in the society for proper use of antibiotics.

Key words: PIL: patient Information leaf let, CP: Community Pharmacy, PX: Prescription, RPH: Registered Pharmacist PC: Patient Counseling, OTC : Over the counter Products , Antibiotics**,** **PCI:** Pharmacy Council of India

Introduction:

Community pharmacists are the healthcare professionals who provide various services to the public by supplying & sell medicines with/without prescription when legally permitted to improve health.

Scenarios of community pharmacy practice: In countries like the UK, Australia, USA, Europe, etc..., Pharmacists are involved in various healthcare education programs on preventive measures for various diseases, dental care, and medication adherence. They provide patient counseling and play a significant role in the rational use of drugs.

In India, a community pharmacy is named "Medical & General Stores," to Startup a pharmacy, the minimum legal requirement is "Registered pharmacist."[1]

Roles and Responsibilities of Community Pharmacist include Processing the prescriptions, Dispensing, Patient counseling, Drug information services, Health Promotion, Health screening services, Responding to symptoms of minor ailments, and Consultation with General Practitioners.

Whereas in the hospital pharmacy, some pharmaceutical manufacturing activity also can be observed in the hospital. [1,2]

According to the Oxford dictionary, dispensing makes up and gives out the medicines on a prescription. The process of dispensing comprises the various components: 1. Technical Component- Receiving and reading the prescription, Adjusting an order according to approved policy, Entry of order, Selecting the drug or determining the product to dispense, Checking the expiry date, Reconstituting a product as per the requirement, Labeling a product, Final physical check for accuracy of a finished product, Maintaining but not interpreting medication profiles, and Maintaining, preparing, and operating equipment. 2. Cognitive Component - Assessing the therapeutic appropriateness of a prescription, Making a recommendation to a prescriber, and Developing the formula for a drug needs to be a specifically prepared pharmacist. .[3]

Patient counseling defines as "providing information to the patient or caregiver regarding the disease, medication, diet and lifestyle modifications in layman language to achieve the desired therapeutic outcomes."

Various Benefits of Patient Counseling are patient understanding of the importance of the prescribed medication in the management of the disease, improved medication adherence,

reduced incidence of adverse effects and unnecessary health care costs, and improved professional rapport between the patient and pharmacist, leading to enhanced patient patronage to the pharmacy.[1]
Patients counseling are essential for patients or their caregivers confused about the use of medicines, Patients with impaired sight or hearing, Illiterate patients, Patients whose profile shows a change in medications or dosing, New patients or those receiving medication for the first time, Parents are receiving medicines on behalf of the children.

A prescription is a written order from a registered medical practitioner to the pharmacist to compound and dispenses a specific medication for the patient. It is essential to ensure that the prescription received is Bonafide one from an authorized prescriber and that the person who brought the medicine is a Bonafide patient. The components of the prescriptions are

1. Superscription: The superscription "Rx." the Latin word recipe, means "Take," and medieval prescriptions invariably began with the command to "take "certain materials and compound them in specified ways.
2. Inscription: Inscription lists the medications' names, quantities, and duration.
3. Subscription: This part of the prescription gives directions to the pharmacist.
4. Signa: This portion is preceded by the abbreviation" Sig," which is Prescriber Signature Block. This must contain a legible signature of the prescriber with the date and the prescriber's full Name, designation, and address, including the registration number and contact phone number.

The patient information leaflet (PIL) contains specific information about medical conditions, doses, and side effects to give users information about the medicine product. The purpose of the PIL is to inform patients or guardians about the administration, precautions, and potential side effects of their prescribed medicine. Components of PIL are

1. The Name of the active substance, dosage form, and strength.
2. Therapeutic use: Conditions for which the medicine is authorized to use.
3. Necessary information before taking medicine: Situations where should not be used drugs, precautions, warnings, and interaction with other medications or foods.
4. Dosage: How to take or use medicine includes route and method of administration.
5. Description of side effects: All the products may occur under routine medical use. [1]

This schedule H contains a list of drugs that can sell only against the prescription of a registered medical practitioner. Another provision that needs to be followed is that it can dispense only the required amount of medication mentioned in the medicine can supply to licensed parties. "The drug label must exhibit the text Rx and schedule H drug warning: to be sold by retails on the prescription of registered medical practitioner only." The Department of Health released the notification on 16th March 2006 under the Ministry of Health and Family Welfare. There are 536 drugs Schedule H drugs.[8]

Schedule H1:This includes 3rd and 4th generation antibiotics, anti-tubercular drugs, and Psychotropic drugs. These drug dispensing are followed, two main criteria followed are; The prescriptions supplied should be recorded in a separate register at the time of supply,

mentioning the Name and address of the prescriber, Name of the patient, Name of the drug along with the quantity supply and these drugs should be labeled with the **Symbol Rx in red**, clearly displayed on the left top corner of the drug label. The label should also bear the following words in a box with a red border and be sold by retail without the prescription of a registered medical practitioner. Schedule H1 Drugs are Cefixime, Cefoperazone, Ceftriaxone, Ceftazidime, Levofloxacin, and Moxifloxacin. Combination Drugs: Levofloxacin + Meropenem, Ceftriaxone + Meropenem, Levofloxacin + Ceftriaxone, Moxifloxacin + Meropenem, Imipenem + Cefepime, Meropenem+ Ceftazidime. [8]

Antibiotics are those agents which act against infection by bactericidal or bacteriostatic effect. These are mainly classified as narrow and broad-spectrum antibiotics depending on a range of bacterial species susceptibility. Some causes of antibiotic resistance are Overuse, longer duration of usage, irrational use, etc., which is a primary global concern.

Dispensing is the provision of drugs set out correctly on a lawful prescription. In severe conditions, antibiotics prescribed and dispensed empirically will be evaluated regarding dose appropriateness and treatment duration.[6]

Antibiotics are mainly indicated for bacterial infections. On viral infections, antibiotics do not show any actions. [5]. In selecting an antibiotic to treat a person with an illness, physicians estimate which bacteria are likely to be the cause and its seriousness; Pharmacokinetics & pharmacodynamics drug parameters, Patient factors, cost of the drugs & Laboratory culture reports. Sometimes can also take combinations Based on the antibiotic susceptibility [4,7]

Over-the-counter (OTC) sale of antibiotics is a global problem. Antibiotics are very commonly prescribed and dispensed to patients in pharmacies. To grab attention and popularity or earn money, Pharmacists dispense multiple drugs in that antibiotics are the most common. This misuse may increase the treatment cost and the development of antimicrobial resistance. Due to this, there is a lack of new drug development by pharmaceutical industries because of reduced economic incentives and challenging regulatory requirements.[3]

A global action plan sets out five strategies to combat this antimicrobial resistance are

- To improve awareness and understanding of antimicrobial resistance.
- To strengthen the knowledge through surveillance and research.
- To reduce the incidence of infection.
- To optimize the use of antimicrobial agents.
- To ensure sustainable investment in countering antimicrobial resistance. .[4]

Need for the study: Limited studies/data in community pharmacies regarding dispensing of antibiotics provoke us to survey to understand antibiotic usage. This study hopes to create awareness in public by educating them and help understand the gaps in improving the health promotion in the Community pharmacy with the following.

Objectives:

Primary Objective: Assessment of the antibiotics dispensing in the community pharmacies

Secondary Objective: 1. To categorize the class of antibiotics used in the various diseases. 2. To check for the appropriateness of the antibiotics observed in the prescription. 3. To understand the pattern of dispensing antibiotics.

Methodology:

A community–based, cross-sectional observational study was conducted over six months, November 2021- to April 2022, after obtaining the ethical clearance (Ref: DSU/CoPS/2021) and permission from the community pharmacist. this study is carried out in the Karnataka- Selected community pharmacies in Kumaraswamy Layout, Kengeri Bengaluru, Gubbi Tumkur District, Ballari, & Srikalahasti Andhra Pradesh.

Source of the Data: Prescription, Patient or caretaker interview, Pharmacist interview

Inclusion Criteria: Study subjects who approach antibiotics with and without prescription. 2. Study included all categories like pediatrics, adults, and geriatrics. 3. Included Study subjects with various comorbidities. 4. Ayurvedic and homeopathic prescription that includes antibiotics.

Exclusion Criteria: Prescription that does not contain antibiotics.

A total of 48 community pharmacies were visited & approached in the different locations of Karnataka, and 26 were permitted to conduct our study. Among them, only one pharmacy instructed not to distribute PIL.

A suitable questionnaire will be prepared, including socio-demographic data, knowledge, and attitude towards antibiotics and their resistance among patients, and knowledge and dispensing practice of antibiotics among pharmacists.

Although our inclusion criteria comprised Ayurvedic and homeopathic prescriptions, we did not find either of them. Project researchers have repeatedly visited the pharmacies on weekdays; visiting hours were after completing classes and on weekends full-day. On average, each researcher covered 3 hours a day. Study subjects, when seen at the pharmacy with/without prescription, we initially approached, introduced ourselves, and gathered information related to our study. Study subjects interacted very well, where some accepted PIL and some denied it.

Some of the study subjects were appreciated and encouraged us to distribute PIL.

Data obtained were tabulated, and descriptive statistical analyses were applied by using SPSS Software 17 th Version.

Results: The various information observed in the 26 pharmacies given in the multiple tables

Table 1: Distribution of the pharmacies & their visits

S No.	Name of the pharmacy	N(%)
1	15F Medicals	7 (1.3%)
2	Aruna Medicals	3 (0.6%)
3	Balaji Medicals	7 (1.3%)

4	Bharath Medicals	3 (0.6%)
5	Bharathi medicals	7 (1.3%)
6	Dharani pharma	15 (2.8%)
7	Jyothi Medical and General	18 (3.3%)
8	Mahadev Drug House	7 (1.3%)
9	Mahaveer pharmacy	165 (30.7%)
10	Manvith Pharmacy	63 (11.7%)
11	Mathru Pharma	2 (0.4%)
12	Medplus	2 (0.4%)
13	Nanda Medical Distributors	4 (0.7%)
14	New Ballari Medicals	21 (3.9%)
15	New medzone Medical and fancy	3 (0.6%)
16	New Rama Pharmacy	3 (0.6%)
17	New Victoria Medicals	12 (2.2%)
18	Patel pharma	6 (1.1%)
19	PM - Jana Aushadhi Kendra	3 (0.6%)
20	Ram medicals and general stores	3 (0.6%)
21	Sagar hospital - OP pharmacy	27 (5.0)
22	Samrudh Pharma	1 (0.2%)
23	SCS medicals	98(18.2%)
24	Shanta Pharma	13 (2.4%)
25	Sree Murthy Pharma	31 (5.8%)
26	Sree Sai Shanthi Drug House	14 (2.6%)
	Total	538(100.0%)

Among 26 pharmacies visits, the highest visited pharmacy was Mahaveer pharmacy, i.e., 165(30.7%), and 2nd highest was SCS medicals, i.e., 98(18.2%), 3rd highest was Manvith pharmacy with a frequency of 63(11.7%) and the least visited pharmacy was Samrudh pharmacy with a frequency of 1(0.2%).

The highest number of antibiotics dispensers hold a Diploma in Pharmacy(D Pharm) 393(73%). Interestingly, even Doctor of Pharmacy (pharma D) had dispensers in the pharmacies and found antibiotics Shared out / issued by Pharm D graduates found to be 8(1.5%). Also observed are Other dispensers/pharmacists found in pharmacies from different backgrounds apart from pharma degrees. In the study period Second PUC(20 (3.7%), Bachelor of Commerce (B Com) 7 (1.3%), Bachelor of Pharmacy (B Pharm)32 (5.9%), Bachelor of Arts & Bachelor of Business administration (BA & BBA) Graduates were 63 (11.7%);12 (2.2%), D.Pharm with B Pharm were 3 (0.6%) were also observed.

Among 26 pharmacies, Gave only eight their registered Pharmacist Number (RPH); the rest were hesitant to provide registration numbers.

Out of 538 pharmacy visit times (26 pharmacies), antibiotics dispensed showed that 355(66%) were issued with a prescription, and 183 (34%) were dispensed without a prescription. The response by the consumers for the no PX(Without Px) of antibiotic information purchases response were based on old prescription25(4.6%); old strips were 31(5.8%); Based on picture shown in phone5 (1.0%); Doctor prescribed through phone2 (0.4%): Family doctor 5 (0.9%) & through friends 4 (0.89%); pharmacist suggested were found to be 120(22.3%); Self-knowledge16 (3.0%) & restocking 1 (0.2%). Among the PX, 188(34.9%) had no prescription legality, 181(33.6%) were without prescription, and 169(31.4%) were found prescription with the legal format.

Table 2: Distribution of Drugs purchased for self-administration response

S No.	Response	N(%)
Drugs purchased for self-administration response		
1	Yes	392 (72.9%)
2	No	146 (27.1%)
	Total	538 (100.0%)
If no, Age Range		
1	0-10	27 (5.4%)
2	11-20	8 (1.6%)
3	21-30	30 (5.7%)
4	31-40	48 (9.1%)
5	41-50	5 (1.0%)
6	51-60	9 (1.7%)
7	61-70	9 (1.7%)
8	71-80	5 (1.0%)
9	81-90	5 (1.0%)
10	Age not known	392 (72.9%)
	Total	538 (100.0%)
If no, Gender		
1	For self-administration	392 (72.9%)
2	F	83 (15.4%)
3	M	63 (11.7%)
	Total	538 (100.0%)

In the total of 538 Visits dispensed antibiotics, Most study subjects came to take medicine for self-, i.e., 392(72.9%) and 146(27.1%) were not for self-administration.

Of 538 dispensed antibiotics, the majority of study subjects, i.e., 392(72.9%) who visited pharmacy age was unknown, least age group i.e41-50, 71-90 yr. Called to the pharmacy were found 5(1%).

Of 538 participants who have visited the pharmacy, the majority were for self-administration i.e. 392(72.9%), and other participants/study subjects who visited the pharmacy to take medicine, not for themselves, in that females and males were found to be 83(15.4%) and 63(11.7%), respectively.

Table 3: Distribution of Antibiotic brand name dispensed

S No.	Brand name	N(%)
1	Amoxicillin/ amoxicillin combinations: Acuclav, Alciclav 625, Almox, amox, amoxicillin, amoxil, amoxipen, amoxizin, Augmentin, Augmentin + Metrogyl , Augmention Duo, Bactoclav,Bactoclav 500/125, Bactoclav 500/125mg + Ciprofloxacin,Bactoclav 625,Bactoclav DS 457,QUEMOX,Clavan,Lacom CV,Lacom CV 625,Maximizin 375,Moxikind, MoxikindCV,Moxikind CV 625,Nodimox,Nodimoxplus,Novamox, Novamox +Metrogyl+Novaclav	1(.2)+2(.4)+10(1.9)+1(.2)+1(.2)+ 1(.2)+2(.4)+1(.2)+21(2.6)+1(.2)+ 7(1.3)+1(.2)+1(.2)+6(1.1)+2(.4)+ 1(.2)+1(.2)+2(.4)+2(.4)+1(.2)+1(. 2)+3(.6)+10(1.9)+1(.2)+1(.2)+2(. 4)+1(.2)+1(.2)=85(15)
2	Azithromycin/azithromycin combination AF Kit, Clingen , AF kit, Clingenforte,ATM 100,Azax,Azee, Azibact, Azibest,Azicec,AzicipAzikem, Aziken, , Azilide, Azinue, Azispan, Azithral, Azithrin, Aziz, Azorik,microbact, Zady, ZadyLizolife,Zady+Zithroleaf ,Servazith ,HHazi	1(.2)+1(.2)+1(.2)+1(.2)+15(2.8)+ 1(.2)+1(.2)+ +1(.2)+1(.2)+1(.2)+1(.2)+3(.6)+1(.2)+1(.2)+12(2.2)+1(.2)+1(.2)+10 (1.9)+1(0.2)+1(.2)+1(.2)+1(.2)+3(.6)+1(.2)=61(11.9)

3	Cefixime /Cefixime Combinations CefdenCl,Cefimen,CefimenDT,CefimenO,Cefix ,Cefixo,Cefixime,Cefrax,Itcef,Gramocef, Mahacef ,MahacefXL,Mahacef XL , Metrogyl,Spectratil,Spectratil,AZilideDT,Spectratil,AZywell,SPectratil,Doax,Spectratil,DoxkemLB,Spectratil,Doxylab,Spectratil,DOxylate,Sectratil,Flagyl,Spectratil,Fucibet,Spectratil,Keto 4s,Spectratil ,Zady,Taximo,Zifi,Zifio,Zifisyrup,Zim,FexicefCV,FixicanO,NufiximeAZ,Omnicef,OmnicefO,Rite O cef,Safexim	10(1.9)+4(.7)+2(.4)+1(.2)+4(.7)+7(11.3)+2(0.4)+1(.2)+1(.2)+1(.2)+7(1.3)+17(3.1)+1(.2)+46(8.6)+2(.4)+2(.4)+1(.2)+1(.2)+2(.4)+1(.2)+1(.2)+2(.4)+1(.2)+6(1.1)+20(3.7)+2(.4)+1(.2)+1(.2)+1(.2)+1(.2)+1(.2)+1(.2)+3(.6)+2(.4)+1(.2)+1(.2)=158(39.8)
4	Cefpodoxime/Cefpodoxime combinations Cepodem,Cepowel,Gudcef,GudcefCV,Gudcefplus,Gudcef plus,O2,Microcef,Xone,Tambac,Zedocef, Taxim O	2(.4)+6(1.1)+5(.9)+3(.6)+8(1.5)+1(.2)+2(.4)+1(.2)+1(.2)+1(.2)+1(.2)=31(5.9)
5	Cefuroxime/Combinations Cefakind,Cefaprime	1(.2)+1(.2)=2(.4)
6	Cephalexin OcephO,Sporidex	1(.2)+3(.6)=4(.8)
7	Cefditoren Zostum	2(.4)
8	Clarithromycin/Clarithromycon combinations Claribrid,Limid,ClindacA,Clindac gel	1(.2)+1(.2)+1(.2)=3(.6)
9	Clindamycin CansoftCL,Clingen, ClingenForte,Aunesol	2(.4)+3(.6)+2(.4)+1(.2)=8(1.6)

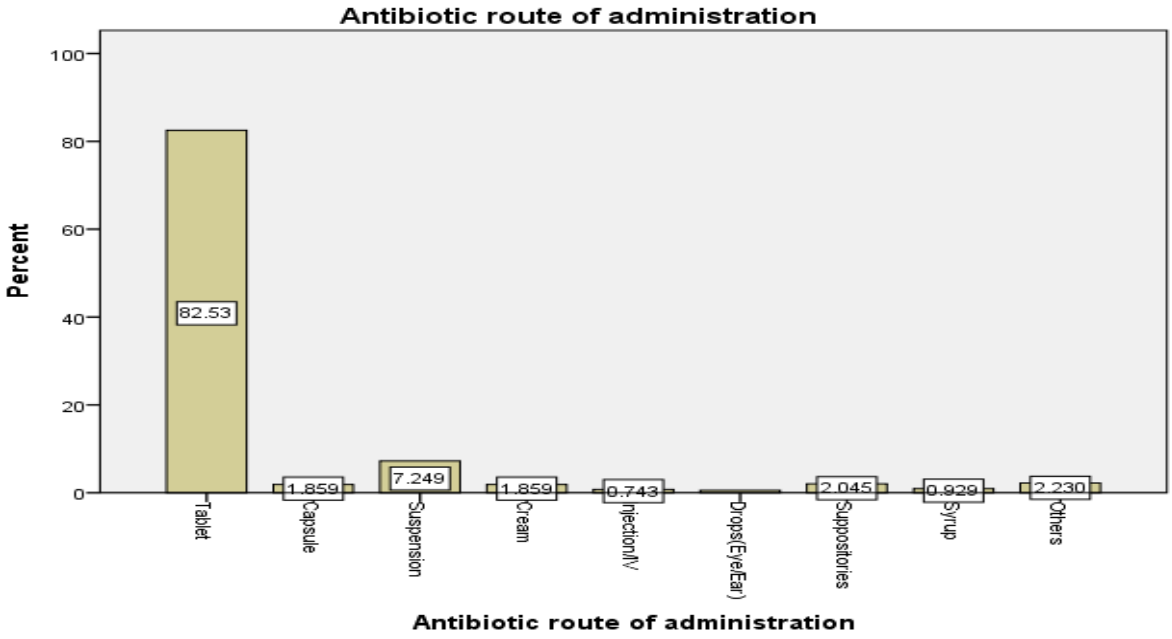
10	Ciprofloxacin/Ciprofloxacin combination Ciplox,Ciplox,Clingen,Cipmx,Cprodac,Ciproflox,Ciprolin,Ciprovid,CIiprozol,Synthocip	4(.7)+1(.2)+2(.4)+15(2.8)+1(.2)+1(.2)+1(.2)+6(1.1)+14(2.6)=45(8.4)
11	Chloramphenicol Paraxin,Glybiotic	1(.2)+1(.2)=2(.4)
12	Clotrimazole/clotrimazole combination Clop GM,Azee,Candid CL	1(.2)+2(.4)=3(.6)
13	Doxycycline/ Doxycycline combination Doxid,Doxid,Spectratil,DoxkenLB,Spectratil,Doxy,ClindacA,Doxy,METROGYL,Doxy,Meytrogyl,ClingenForte,Doxy,Metrogyl,Clingen,Doxylab,Doxylab,Spectratil	1(.2)+1(.2)+1(.2)+1(.2)+3(.6)+1(.2)+1(.2)+1(.2)+1(.2)=11(2.2)
14	Erythromycin Erythro	2(.4)
15	Faropenem Faronac	1(.2)
16	Framycetin	1(.2)
17	Gentamicin CosvateGM,Genticyn	1(.2)+1(.2)=2(.4)
18	Levofloxacin/combinations Levobact,Levoday,Levoflox,Levokac,Levostand,Lovolkem,Monoflox OZ	2(.4)+6(1.1)+3(.6)+2(.4)+2(.4)+1(.2)+1(.2)+1(.2)=18(3.5)
19	LInezolid Linid, LIzoforce	3(.6)+5(.9)=8(1.5)
20	Moxifloxacin MOxital CV	1(.2)

21	Metrogyl Flagyl	2(.4)
22	Mupirocin T bact	1(.2)
23	Norfloxacin/Combinations Noraday 400 NF,Noraday TZ NF,Norflox,NorfloxTZ,Nordys	1(.2)+2(.4)+5(.9)+2(.4)+1(.2)=11(2.1)
24	Nadifloxacin Erbez	1(.2)
25	Neomycin Nebasulf	1(.2)
26	Ofloxacin/combinations Q mox,Brakke,Keto 4s,Mirobid,O2,Oflomac,Oflox ,OfloxOZ,Zenflox, OrniO,Omox, Saril	1(.2)+4(.7)+1(.2)+25(4.6)+4(.7)+1(.2)+2(.4)+11(2.1)+5(1)+1(.2)+1(.2)+1(.2)+1(.2)=58(10.9)
27	Penicillin Penicil CV, Pencil CV 375	3(.6)+3(.6)=6(1.2)
28	Piperacillin Tazopen	1(.2)
29	Rifaximin Rcifax,Rifagut,	1(.2)+1(.2)=2(.4)
30	Roxithromycin Roxikem	1(.2)
31	Virleno	1(.2)
	Total	538(100.0%)

Among 538 dispensed different brands of antibiotics, the highly distributed brand was Spectratil with a frequency of 46(8.6%), Microbid with a frequency of 26(4.8%), Mahacef with

a frequency of 24(4.4%) and Augmentin with a frequency of 18(3.4%), and the least dispensed brand was Q max with a frequency of 1(0.2%), OFM with a frequency of 1(0/2%).

Fig1: Distribution of route of antibiotic administrations



Among different dispensed routes, mostly issued dosage form was Tablet 444(82.5%) and the least distributed were drops3 (0.6%).

Table 4: Distribution of Antibiotic classification Dispense in Community Pharmacies

S.no	Antibiotic Class	N(%)
1	Cephalosporin's	138 (25.7%)
2	Linezolid	10 (1.9%)
3	Fluoroquinolones	118 (21.9%)
4	Penicillin's	66 (12.3%)
5	Nitroimidazole	3 (0.6%)
6	Aminoglycosides	2 (0.4%)
7	Macrolides	69 (12.8%)
8	Protein synthesis inhibitors	3 (0.4%)

9	Tetracyclines	2 (0.4%)
10	Carboxylic acid	1 (0.2%)
11	Lincomycin	3 (0.6%)
12	Rifamycin	3 (0.6%)
13	Carbapenems	1 (0.2%)
14	Cephalosporins+penicillin's	8 (1.5%)
15	Cephalosporins+Fluroquinolones	13 (2.4%)
16	Cephalosporins+Beta Lactams	18 (3.3%)
17	Cephalosporins+Nitroimidazole	2 (0.4%)
18	Cephalosporins+macrolides	10 (1.9%)
19	Fluroquinolones+Nitroimidazole	15 (2.8%)
20	Fluroquinolones+penicillin's	1 (0.2%)
21	Penicillin's+Beta lactams	27 (5.0%)
22	Penicillin's+Nitroimidazoles	3 (0.6%)
23	Aminoglycosides+Macrolides	1 (0.2%)
24	Cephalosporins+Tetracyclines	8 (1.5%)
25	Tetracyclines+lincomycin+Nitroimidazole	1 (0.2%)
26	Linezolid+Nitroimidazole+Tetracyclines	1 (0.2%)
27	Linezolid+Nitroimidazole	1 (0.2%)
28	Nitroimidazole+Tetracyclines	3 (0.6%)
29	Linezolid+Nitroimidazole+Macrolides	1 (0.2%)
30	Linezolid+Tetracyclines	1 (0.2%)
31	Linezolid+Macrolide	2 (0.4%)
32	Cephalosporins+Steroid antibiotics	2 (0.4%)

33	Fluroquinolones+Macrolides	1 (0.2%)
	Total	538 (100.0%)

Among different class of antibiotics ,highly dispensed were Cephalosporins 138(25.7%) and least dispensed were Carboxylic acid 1(0.2%) , Carbapenems1(0.2%) ,Fluoroquinolones + Penicillin's combination1(0.2%),Aminoglycosides + Macrolides combination1(0.2%), Tetracyclines + lincomycin + Nitroimidazole 1(0.2%), Linezolid + Nitroimidazole1(0.2%), Linezolid + Nitroimidazole + Macrolide1(0.2%), Linezolid +Tetracycline1(0.2%), Fluoroquinolone + Macrolide 1(0.2%) with frequency and percentage respectively.

Among different schedules of antibiotics, Highly dispensed Schedule H drugs with a frequency of 333(61.90%), Schedule H1 were 146 (27.14 %), and the least issued were a combination of Schedule H +H1 with a frequency of 59 (11%).

Table 5: Distribution of Antibiotic duration

S No.	Duration of Antibiotic	N(%)
1.	0	131 (24.3%)
2.	0,0	1 (0.2%)
3.	1 day	5 (1.0%)
4.	10 days	2 (0.4%)
5.	10days	1 (0.2%)
6.	1day, 1day	1 (0.2%)
7.	1week	1 (0.2%)
8.	2 days	34 (6.3%)
9.	2 days, 6 days	1 (0.2%)
10.	2 weeks	1 (0.2%)
11.	2 weeks, 2-3 weeks	1 (0.2%)
12.	3 days	92 (17.1%)
13.	3 days, 3 days	2 (0.4%)

14.	4 days	4 (0.7%)
15.	5 days	216 (%)
16.	5 days, 0	4 (0.8%)
17.	5 days, 3 days	8 (1.5%)
18.	5 days, 5 days	5 (1.0%)
19.	5 days, 5 days, 2 days	1 (0.2%)
20.	5days, 5days, 6days	1 (0.2%)
21.	6days	4 (1.3%)
22.	7 days	5 (1.0%)
23.	8days	9 (1.7%)
24.	SOS	5 (0.9%)
	Total	538 (100.0%)

Among Antibiotic duration of usage, there was mainly no mention of the period of use of 131(24.3%), with the least mentioned as one day.

Table 6: Distribution of Study subject's demographics visited the pharmacy

S No.	Demographics	N(%)
Age Range		
1	0-10	69 (12.8%)
2	11-20	40 (7.4%)
3	21-30	136 (25.3%)
4	31-40	106 (19.7%)
5	41-50	68 (12.6%)
6	51-60	61 (11.3%)
7	61-70	38 (7.1%)

8	71-80	15 (2.8%)
9	81-90	5 (0.9%)
	Total	538 (100.0%)
Gender		
1	Male	275 (51.1%)
2	Female	263 (48.9%)
	Total	538 (100.0%)
Education		
1	Not studied	17 (3.2%)
2	Basic education	233 (43.3%)
3	SSLC/ X Class	27 (5.0%)
4	More than SSLC	204 (37.9%)
5	Not mentioned	57 (10.6%)
	Total	538 (100.0%)
Occupation		
1	House wife	111 (20.6%)
2	Employed	165 (30.7%)
3	Unemployed	199 (37.0%)
4	Not mentioned	63 (11.7%)
	Total	538 (100.0%)
Marital Status		
1	Married	338 (62.8%)
2	unmarried	200 (37.2%)
	Total	538 (100.0%)

BMI Category		
1	No	45 (8.4%)
2	Underweight	49 (9.1%)
3	Normal(18.6-24.9)	289 (53.7%)
4	Overweight(25-29.9)	139 (25.8%)
5	Obese(greater than or 30)	16 (3.0%)
	Total	538 (100.0%)
Smoking Habits		
1	Yes	69 (12.8%)
2	no	469 (87.2%)
	Total	538 (100.0%)
Drinking Habits		
1	Yes	76 (14.1%)
2	No	417 (77.5%)
3	Occasional	45 (8.4%)
	Total	538 (100.0%)
Diet		
1	Veg	194 (36.1%)
2	Mixed	344 (63.9%)
	Total	538 (100.0%)
Sleep Pattern		
1	Normal	419 (77.9%)
2	Disturbed	119 (22.1%)
	Total	538 (100.0%)

The highest age groups that visited the pharmacy were 21-30:136(25.3%) and 31-40:106(19.7%). And the least was 81-90:5(0.9%).

Out of 538 study subjects, the most visited the pharmacy were males, 275(51.1%), and the least were females, 263(48.9%).

Among the 538 study subjects, 233(43.3%) had primary education, 204(37.9%) studied more than SSLC were highest, and study subjects who studied till SSLC/ X Class 27(5%) are least.

In this study, most of the study subjects were unemployed, Employed 199(37%) and the 2nd highest 165(30.7%) and the some of the study subjects not mentioned 63(11.7%) about their occupation and they were least in frequency.

Out of 538 study subjects, the most visited study subjects in the pharmacy were married, 338(62.8%), and the least were unmarried, 200(37.2%).

Found More than half of the study subjects' BMI was to be Normal 289(53.7%) and Overweight 139(25.8%), and only some of the study subjects were Obese 16(3%).

Among 538 study subjects, most were non-smokers, 469(87.2%), and the remaining were smokers, 69(12.8%).

Out of 538 study subjects, most of them were Non- drinkers, 417(77.5%), and the least were Occasional Drinkers, 45(8.4%).

Most of the study subjects' diets were mixed, 344 (63.9%), and the lowest were Vegetarians, 194(36.1%) out of 538.

Among 538 study patients, the sleep pattern was regular 419(77.9%), and some of the study subjects' sleep pattern was disturbed 119(22.1%).

Table 7: Distribution of Reason for usage of antibiotics

S No.	Reason for usage of antibiotics	N (%)
1	No idea	128 (23.8%)
2	Cough/cold/ fever/running nose/headache	190 (35.3%)
3	Sore throat/throat pain	32 (5.9%)
4	Stomach-ache / diarrhea	25 (4.6%)
5	Toothache/tooth pain/tooth decay	72 (13.4%)

6	Itching/skin rash/acne	13 (2.4%)
7	Infections	62 (11.5%)
8	Cough cold + fever + running nose + headache	13 (2.4%)
9	Cough cold + fever + running nose + headache + tooth ache/tooth pain/tooth decay	1 (0.2%)
10	Sore throat/ throat pain +stomach ache + diarrhoea	1 (0.2%)
11	Cough/cold/ fever/running nose/headache/stomach ache/diarrhoea	1 (0.2%)
	Total	538 (100.0%)

Among the 538 study subjects, the reason for taking the antibiotics was highest for Cough/cold/ fever/running nose/ headache complaint 190(35.3%), and the least were complaints were sore throat/ throat pain and stomach ache and diarrhea 1(0.2%).

Table 8: Distribution of Study subjects' response to antibiotics and it's resistance

S No.	Responses	N (%)
Antibiotics		
1	Yes	77 (14.3%)
2	Don't Know	461 (85.7%)
	Total	538 (100.0%)
Antibiotic Resistance		
1	Yes	62 (11.5%)
2	No	39 (7.3%)
3	Don't know	437 (81.2%)
	Total	538 (100.0%)
Sources of information about antibiotic and its resistance		
1	Yes	64 (11.9%)

2	Don’t know	474 (88.1%)
	Total	538 (100.0%)
Antibiotic resistance means bacteria will not be killed by antibiotic		
1	Yes	51 (9.5%)
2	No	2 (0.4%)
3	Don’t Know	485 (90.1%)
	Total	538 (100.0%)
Antibiotic resistance bacteria is difficult to eradicate		
1	Yes	49 (9.1%)
2	No	2 (0.4%)
3	Don’t Know	487 (90.5%)
	Total	538 (100.0%)
Indiscriminate usage of antibiotics can cause bacterial resistance		
1	Yes	36 (6.7%)
2	No	6 (1.1%)
3	Don’t Know	496 (92.2%)
	Total	538 (100.0%)
Usage of antibiotic when there is no need is a cause for bacterial resistance		
1	Yes	39 (7.2%)
2	No	5 (0.9%)
3	Don’t Know	494 (91.8%)
	Total	538 (100.0%)
Incomplete course of antibiotic leads to bacterial resistance		

1	Yes	31 (5.8%)
2	No	8 (1.5%)
3	Don’t Know	499 (92.8%)
	Total	538 (100.0%)
Over usage of antibacterial leads to bacterial resistance		
1	Yes	39 (7.2%)
2	No	2 (0.4%)
3	Do not know	497 (92.4%)
	Total	538 (100.0%)
Longer duration of antibiotic increases bacterial resistance		
1	Yes	36 (6.7%)
2	No	3 (0.6%)
3	Don’t know	499 (92.8%)
	Total	538 (100.0%)
Whether resistance bacteria can be transmitted from one to another		
1	Yes	23 (4.3%)
2	No	6 (1.1%)
3	Don’t know	509 (94.6%)
	Total	538 (100.0%)
Whether resistance occur due to resistance in the body not by the bacteria		
1	Yes	23 (4.3%)
2	No	10 (1.9%)
3	Don’t know	505 (93.9%)

	Total	538 (100.0%)

Most of the study subjects Have not heard about antibiotics, 461(85.7%), and only some have listened about antibiotics, 77(14.3) out of 538.

Most of the study subjects Don't know about antibiotic resistance, and the frequency is 437(81.2%), and only some have no idea about antibiotic resistance 39(7.3%).

Most of the study subjects Don't know about the sources of antibiotic resistance 474(88.1%), and only some know the origins of antibiotic resistance 64(11.9%).

Most of the study subjects Don't know about response to Antibiotic resistance. This means bacteria will not be killed by antibiotics 485(90.1%). The least of them have replied no 2(0.4%) out of 538 study subjects.

Most of the study subjects Didn't know that Antibiotic resistance means antibiotics will not kill bacteria, 487(90.5%) and the least of them have replied no 2(0.4%) out of 538 study subjects.

Most of the study subjects Don't know that the Indiscriminate use of antibiotics causes bacterial resistance 496(92.2%), and the least of them have replied no 6(1.1%) out of 538 study subjects.

Most of the study subjects Don't know that Usage of antibiotics when there is no need is a cause of bacterial Resistance 494(91.8%), and the least of them have replied no 5(0.9%) out of 538 study subjects.

Most of the study subjects Don't know that an Incomplete course of antibiotic lead to bacterial resistance 499(92.8%), and most minor of them have replied no 8(1.5%) out of 538 study subjects.

Most of the study subjects Don't know that Over Usage of antibacterial leads to bacterial resistance 497(92.4%), and the least of them have replied no 3(0.4%) out of 538 study subjects.

Among 538 study subjects, 36(6.7%) said a longer duration of antibiotic would increase bacterial resistance, 3(0.6%) said a more extended period of antibiotic does not increase bacterial resistance, and 499(92.8) did not know about antibiotic resistance.

Among 538 study subjects, 23(4.3%) said resistance bacteria can be transmitted from one patient to another, 6(1.1%) said it could not be transferred resistance bacteria from one patient to another, and 509(94.6%) did not know about antibiotic resistance.

Among 538 study subjects, 23(4.3%) agreed that antibiotic resistance occurs due to resistance in the body, not by the bacteria, and 10(1.9%) did not agree that antibiotic resistance arises due to resistance in the body, not by the bacteria, 505(93.9%) did not know about antibiotic resistance.

Table 9: Distribution of If yes sources of information about antibiotics and its resistance

S No.	Sources of Information	N (%)
1	No idea about antibiotics	465 (86.4%)
2	Social Media	13 (2.4%)
3	Friends & relatives	2 (0.4%)
4	Pharmacist	15 (2.8%)
5	Physician	26 (4.8%)
6	Friends & relative + social media	11 (2.0%)
7	Social media + Pharmacist	1 (0.2%)
8	Social Media +Physician	2 (0.4%)
9	Pharmacist+ Physician	1 (0.2%)
10	Social media + Pharmacist + Physician	2 (0.4%)
	Total	538 (100.0%)

Among 538 study subjects, 465 (86.4%) have no idea about antibiotics, 26(4.8%) have heard from a physician, and only some of them have listened to both pharmacist and physician i.e.., 1(0.2%).

Responsive /opinion antibiotic stoppage by 538 study subjects **showed** 308(57.2%) said they could stop antibiotics after completion of the course, 193(35.9%) said antibiotics could be stopped when patient feel better, 37(6.9%) did not know about antibiotics

Table 10: Distribution of Registered pharmacist activity in the community pharmacy

S No.	Response	N (%)
Registered pharmacist dispense the medication in the pharmacy		

1	Yes	439 (81.6%)
2	No	99 (18.4%)
	Total	538 (100.0%)
Pharmacist provide patient counselling		
1	Yes	361 (67.1%)
2	No	177 (32.9%)
	Total	538 (100.0%)

Out of 538 dispensed antibiotics, 439(81.6%) were issued by registered pharmacists, and 99(18.4) were not Registered pharmacists.

Out of 538 study subjects, 361(67.1%) were provided patient counseling by the pharmacist, and 177(32.9%) were not provided. 1-3 minutes patient counseling interactions were 416 (77.3%); 4-7 minutes counseling interaction were 9 (1.7%). The majority of pharmacist-patient counseling interaction time was 1 min with a frequency of 188(35%) and 2 mins with a frequency of 168(31.2%), and the least interaction time was 2.5 mins, 4 mins, 5 mins with a frequency of 4(0.8%). The pharmacist's response to various questions by the patient was 538(100 %) satisfactory in our study.

Table11: Distribution of Duration of pharmacist-patient counseling interaction

S No.	Response	N (%)
Pharmacist should not dispense antibiotic without a valid prescription		
1	Yes	440 (81.8%)
2	No	98 (18.2%)
	Total	538 (100.0%)
Pharmacist dispense antibiotics without prescription on the basis of		
1	Self-knowledge	157 (29.2%)
2	Request by the patient	37 (6.9%)
3	Request by patient and self-knowledge	344 (63.9%)

	Total	538 (100.0%)
Pharmacist response to inappropriate use of antibiotics promote antimicrobial resistance		
1	Yes	509 (94.6%)
2	No	29 (5.4%)
	Total	538 (100.0%)
Does pharmacist dispense antibiotics other than bacterial infections		
1	Yes	128 (23.8%)
2	No	410 (76.2%)
	Total	538 (100.0%)
Knowledge on antibiotic susceptibility		
1	Yes	442 (88.2%)
2	No	96 (17.8%)
	Total	538 (100.0%)

Among 26 pharmacy visits, 440(81.8%) agreed that pharmacists should not dispense antibiotics without a valid prescription, and 98(18.2%) did not agree that pharmacists should not dispense antibiotics without a valid prescription.

Out of 26 pharmacists, 157(29.2%) use their knowledge to dispense antibiotics without prescription, 37(6.9%) dispense antibiotics with medication as the patient requests it, and 344(64.9%) dispense antibiotics both by self-knowledge and request by the patient.

Out of 26 pharmacists, 509(94.6%) agreed that inappropriate use of antibiotics promotes antimicrobial resistance, and 29(5.4%) did not agree that improper antibiotics promote antimicrobial resistance.

Out of 26 pharmacists, 128(23.8%) dispense antibiotic other than bacterial infection, and 410(76.32%) does not administer antibiotics other than bacterial infections.

Out of 26 pharmacists, 442(82.2%) know about antibiotic susceptibility, and 96(17.8%) do not know about antibiotic susceptibility.

Most pharmacists didn't describe and had no idea about the susceptibility (89.6%), and only a few described 56 (10.4%). Of which 31(5.8%) know about antibiotic susceptibility but did not

explain,12(2.2%), For fever, cold, stomach pain, vomiting, etc., in the most minor 5(0.9%) said for secondary infections – cephalosporin's, mild infections- low generation antibiotics.

Table 12: Distribution of Duration of patient-project candidate interaction and Time spent by the project candidate in pharmacy

S No.	Duration	N (%)
Duration of patient-project candidate interaction		
1	0 min	6 (1.1%)
2	0.5 min	7 (1.4%)
3	1 min	262 (48.8%)
4	1.5 mins	42 (7.8%)
5	2 mins	141 (26.8%)
6	2.5 mins	13 (2.4%)
7	3 mins	44 (8.2%)
8	3.5 mins	3 (0.6%)
9	4 mins	9 (1.7%)
10	5 mins	10 (1.9%)
11	6 mins	1 (0.2%)
	Total	538 (100.0%)
Duration of patient-project candidate interaction coding		
1	1-3 min	518 (96.3%)
2	4-7 min	20 (3.7%)
	Total	538 (100.0%)
Time spent by the project candidate in pharmacy		
1	100 mins	6 (1.1%)
2	120 mins	27 (5.0%)

3	140 mins	14 (2.6%)
4	180 mins	36 (6.7%)
5	190 mins	3 (0.6%)
6	200 mins	22 (4.1%)
7	210 mins	12 (2.2%)
8	220 mins	3 (0.6%)
9	230 mins	22 (4.1%)
10	240 mins	330 (61.4%)
11	260 mins	16 (3.0%)
12	300 mins	17 (3.2%)
13	50 mins	1 (0.2%)
14	60 mins	17 (3.2%)
15	80 mins	4 (0.7%)
16	90 mins	8 (1.5%)
	Total	538 (100.0%)

Out of 26 pharmacists, 532(98.9%) know about schedule H1, and 6(1.1%) do not know about schedule H1. Of 26 pharmacies, 512(95.2%) follow the Schedule H1 act, and 26(4.8%) do not follow it. None of the pharmacists described it.

Table 13: Distribution of Duration of patient-project candidate interaction and Time spent by the project candidate in pharmacy

S No.	Duration	N (%)
Duration of patient-project candidate interaction		
1	0 min	6 (1.1%)
2	0.5 min	7 (1.4%)
3	1 min	262 (48.8%)

4	1.5 mins	42 (7.8%)
5	2 mins	141 (26.8%)
6	2.5 mins	13 (2.4%)
7	3 mins	44 (8.2%)
8	3.5 mins	3 (0.6%)
9	4 mins	9 (1.7%)
10	5 mins	10 (1.9%)
11	6 mins	1 (0.2%)
	Total	538 (100.0%)
Duration of patient-project candidate interaction coding		
1	1-3 min	518 (96.3%)
2	4-7 min	20 (3.7%)
	Total	538 (100.0%)
Time spent by the project candidate in pharmacy		
1	100 mins	6 (1.1%)
2	120 mins	27 (5.0%)
3	140 mins	14 (2.6%)
4	180 mins	36 (6.7%)
5	190 mins	3 (0.6%)
6	200 mins	22 (4.1%)
7	210 mins	12 (2.2%)
8	220 mins	3 (0.6%)
9	230 mins	22 (4.1%)
10	240 mins	330 (61.4%)

11	260 mins	16 (3.0%)
12	300 mins	17 (3.2%)
13	50 mins	1 (0.2%)
14	60 mins	17 (3.2%)
15	80 mins	4 (0.7%)
16	90 mins	8 (1.5%)
	Total	538 (100.0%)

Among 538 study subjects, the highest duration of patient-project candidate interaction was 1 min, 262(48.8%), and 2 mins 141(26.8%), least among them was 6 mins 1(0.2%).

Among 26 pharmacy visits and 538 dispensed antibiotics, the majority of the time spent in a day in a pharmacy was 240 mins 330(61.4%) and 180 mins 36(6.7%), the least time spent in a day in a pharmacy was 50mins 1(0.2%).

Among 538 study subjects, 406(75.5%) Community pharmacists accepted the antibiotic patient information leaflet (PIL), whereas 122(22.7%) Community pharmacists denied the PIL, and 10(1.9%) Community pharmacists did not permit us to distribute PIL.

The patients/ consumers expressed where ever the Patient information leaflets distributed were helpful for the consumers/patients by carrying out this type of study more & more

DISCUSSION:

An attempt was made to study the Dispensing pattern of Antibiotics in selected community pharmacies. Our study includes 538 study subjects as per the inclusion and exclusion criteria. This study was performed in 26 community chosen pharmacies, mostly visited pharmacies were Mahaveer pharmacy (30.7%) and SCS pharmacy (18.2%) because the Pharmacist in the pharmacies was cooperative. Study subjects were seen at these pharmacies since it's nearby the hospital, and it was convenient to perform the study in these pharmacies compared to others. The least visited pharmacy was Samrudh (0.2%) because the Pharmacist was not so cooperative, patient visitors were fewer, and it was inconvenient to perform the study. A similar survey was conducted by Randa N in which out of 457 antibiotics dispensed with or without prescription was 31.5% and 24.6%, respectively.[12]

observed that one-third of administered antibiotics were without prescription; they were either based on pharmacist recommendation or directly requested by the patient in the form of the

medication name, dose, old prescription or medicament strip, by a family physician, my friend recommendation, self-knowledge, internet source and so on; which lead self-medication, misuse, and overuse of antibiotics. Patients approach pharmacies without prescription because of high consultation fee issues and for quick relief. A similar study conducted by Nisha Jha showed that 12.8% of dispensing staff hadn't consulted any sources of information for antibiotic dispensing. 85% of the team had dispensed antibiotics without prescription.[13]

The majority of study subjects came with a prescription that was not in a legal format; it might be because of the physician's least interest in prescribing legal structure or simultaneous visits of patients. A similar study was conducted by Dawit G. Weldemariam., which found that 78.63% of the prescription was incomplete form, 54.3% of the prescription was legible, and 30.6% of the prescription were moderately readable.[17]

observed that most of the dispensers in the pharmacies were graduates of D-pharm and B-pharm. Interestingly, even PharmD graduates (8%) were also seen working as a pharmacist in pharmacies. According to the Pharmacy council of India (PCI) guidelines, only licensed pharmacists can dispense the medications. But it's not been followed in our country; with different backgrounds who held diplomas/other degrees apart from pharmacy degrees were also dispensed due to lack of enforcement of rules and regulations to work as Pharmacist in community pharmacist. A similar study conducted by Randa N observed that the qualifications of drug dispensers were B.Sc. degree (66.7%), Diploma (25%), Trainee (1%).[12]

The majority of study subjects visited the pharmacy for medicines for self-administration, and others were not for self-administration. Among the majority of adults (41-90 years), females were more than males because frequently seen infections were more in adults. It might be due to low immunity, improper usage of medicament, etc.

Spectral, Macrobid, Mahacef, and Augmentin were the mostly dispensed antibiotics brands with and without prescriptions. Physicians and pharmacists prefer Cephalosporins and Fluoroquinolones because of the availability of different generations with a wide range of spectrum of activity. The most dispensed antibiotics were in tablet formulation (82.5%). The least administered formulation was ophthalmic solutions (0.6%).

The highest dispensed class of antibiotics in our study was Cephalosporins (25.7%). Since Cephalosporins are broad-spectrum antibiotics and are cost-effective. Less likely to distribute Trio combinations because of both physicians; pharmacists prefer lower generation antibiotics and particular antibiotics unless there are severe patient conditions. A similar study was conducted by BB. Rajalingam showed that the most prescribed antibiotics were Ceftriaxone 15.38% and Levofloxacin 6.76%.[9]

Our study mostly dispensed Schedule H drugs (65%), and a combination of schedule H+H1 (10%) was the least issued. Although most pharmacists have basic knowledge regarding schedules- those antibiotics are not to be dispensed without prescription; Pharmacists dispense in context with profit and sometimes request by the patients.

Antibiotics were dispensed mostly at the frequency of (1-0-1) (69.7%) because of physicians and pharmacists' knowledge regarding antibiotics administrations; particular drugs can be administered two times a day, whereas (0-1-0) (0.2%) at bedtime were least dispensed because of specific necessity for the particular patient. (Ex: on multiple medications, concomitant disease). A similar study conducted by Martine Barchitta observed that Italian healthcare workers exhibited different knowledge, attitudes, and behaviors on antibiotic use and resistance.[14]

In our study, no mention of the duration of usage is (24.3%) since, in most of the community pharmacies, patients directly approached for antibiotics just for 1 or 2 days for cost-saving purposes, quick relief, poor economic conditions, and Pharmacist to grab attention by patients, to increase the number of patient's visit, profit issues.

In this study, the most commonly visited study subjects were the pharmacies, wherein the age group 21-30 (25.3%) and 31-40 (19.7%), and the least were 81-90 (0.9%). The geriatrics couldn't make it to the pharmacy, so their guardians came on their behalf. Males visited the pharmacies more than females.

The majority of the study subjects had only primary education (43.3%). The prevalence of the study subjects' BMI was average (53.7%), and the least was categorized as Obese (3%). Among 538 study subjects, 469 were non-smokers (87.2%). Three-quarters of the study subjects' sleep pattern was regular, and others were disturbed due to various conditions like cold, cough, sore throat, etc.

More than one-third of the study population (35.3%) had Cough/cold/ fever/running nose/headache as their reason for the usage of antibiotics. A similar study conducted by Jas Min Oh observed that 50% of the sample believed that antibiotics could treat viral infections. And other one-third of the study subjects had no idea why they were using antibiotics.[10]

Among all the present illnesses mentioned by the study subject, sore throat/ throat pain +stomach-ache +diarrhoea were the least in number. Among 538 study subjects, only 78 had a past medical history, out of which DM and HTN were found in common. In our study (41.3%) present illness was cough and fever due to Covid 19 scenario and other weather conditions. During our study period, Covid 19 pandemic was exaggerated.

When project candidates interacted with the study subjects, asked various questions about antibiotics and their resistance, like what are antibiotics? Whether antibiotic resistance can be eradicated or not? etc. (9.5%) were aware that antibiotic resistance means antibiotics would not kill bacteria, (9.1%) were aware that antibiotic resistance bacteria is difficult to eradicate, (7.2%) were aware that the use of antibiotics when there is no need is a cause for bacterial resistance, (35.9%)stop antibiotics when symptoms improve. A similar study conducted by MaritWaaseth showed that 44% of study subjects were aware that antibiotic resistance means that the antibiotic would not kill bacteria, 42% were aware that antibiotic resistance bacteria is difficult to eradicate, 34% were aware that using antibiotics when there is no need is a cause for bacterial resistance, 42% stop antibiotic when symptoms improve among people of Northern region of Saudi Arabia.[11]

This interaction gave us clear information that there is a lack of awareness of antibiotics and their usage among the public, where our PIL might be helpful for them in curbing knowledge regarding antibiotics.

In the majority of the pharmacies, registered Pharmacists dispense medicines that are suitable for society. But in some pharmacies (18.4%), there were no registered pharmacies that had to be changed, or they should hold a pharmacy degree either.

Comparatively, patient counseling provided by the Pharmacist was good in number (67.1%). A similar study conducted by Hemant Bareth showed that out of 156 participants, reduced nonadherence to antibiotics from 69% to 39%, and adherence increased from 31% to 61% after patient counseling.[15]

Sometimes pharmacists themselves gave counseling and sometimes based on patient queries.

Observed that the majority duration of pharmacist-patient counseling is 1 min(35%) because most of the time, patients are less interested in knowing about the drugs. Sometimes patients might be busy or maybe because of too much crowd in the pharmacy area. Least duration of pharmacist-patient counselling is 2.5 mins (0.7%), 4 mins(0.8%) and 5 mins(0.8%).

Various questions related to community pharmacy, dispensing of drugs, schedule H and H1, etc., were asked to pharmacists by project candidates.

It was done to know about pharmacists' knowledge of community pharmacy in India. Many were not aware of schedule H1 drugs as there were non-registered pharmacists dispensing drugs who did not know about various PCI guidelines. 0.7% stated that antibiotics are effective against viral infections, 2.2% said that antibiotics are effective against fever, stomach pain, and

vomiting, and 17.8% of pharmacists had no knowledge regarding antibiotics indication. In a similar study conducted by Iris Hoxha et al., among 370 community pharmacists in Albania, 55% knew viruses cause colds, and 93% of those antibiotics are ineffective against influenza. 13% stated antibiotics are useless against viruses. Encouragingly, 93% knew penicillin could cause anaphylactic shock, and 74% of those antibiotics kill bacteria, causing infections.[16]

Study subjects interacted well with project candidates. Some wanted to know much about antibiotics which project candidates then explained. Some appreciated our work in distributing the PIL. (75.5%) of them accepted the PIL, which was satisfactory to the project candidates. (1.9%) The pharmacists disagreed with the distribution of PIL, thinking that it might affect their business.

The majority of the time spent in a pharmacy in a day is 240 mins (61.4%) as we used to get cases in good number. The least was 50 mins (0.2%) as fewer visitors to the pharmacy.

Conclusions:

In our study total of 26 pharmacies were selected. The most dispensed class of antibiotics are Cephalosporins (Cefixime, Cefpodoxime, Cefuroxime, Cephalexin, and Cefditoren), Fluoroquinolones (Ciprofloxacin, Ofloxacin, Levofloxacin, Norfloxacin, and Nadifloxacin), Macrolides, Penicillins. Most of the interacted study subjects had no idea about antibiotics and their resistance. We have observed that many pharmacists didn't counsel the patients regarding antibiotics or their usage while dispending. Must overcome this by providing appropriate patient counseling about antibiotics and their resistance by the pharmacist and physicians and conducting awareness programs. All registered pharmacies must hold an essential pharmacy degree. If not, they must implement penalties and detain their pharmacy license strictly. Not only pharmacists and physicians, but it's also the duty of every medical and pharmacy student and graduate to provide a good awareness about antibiotics and their usage to the society selflessly whenever possible. Physicians should charge appropriate consultation fees, which can reduce the counts of patients directly approaching the pharmacy without a prescription. As we observed in the presence of the project candidate dispensing of antibiotics without prescription was less. In some pharmacies, the pharmacists didn't allow the distribution of the patient information leaflet (PIL).

LIMITATIONS

- In this study, we had approached 42 pharmacies in which more than 16 pharmacies denied the conduct of our project work as they thought we would disturb their business and for the improper legality issues.
- During the study period, the COVID-19 pandemic was a barrier.

- Some pharmacies didn't allow the distribution of the PIL as they thought providing the correct information about antibiotics would affect their business.
- Some of the study subjects denied interacting with the project candidate, and some of them couldn't answer all the questions.
- Some pharmacists behaved differently in the presence of project candidates, which affected the results.

FUTURE DIRECTIONS

- Further studies must be conducted by covering a more significant number of pharmacies and patients in various parts of India.
- Should be implying strict rules regarding improper dispensing practices without certified, licensed pharmacists.
- Must conduct Antibiotic stewardship programs, patient counseling, and national drug awareness programs to make the population knowledgeable about antibiotics and various drug usages.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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