

**A STUDY TO APPRAISE PRACTICE AND CURRENT TRENDS CONCERNING
ANTIBIOTIC USE AND RESISTANCE AMONG COMMUNITY PHARMACISTS - A
CROSS SECTIONAL OBSERVATIONAL STUDY****Sruthi S. L.^{*1}, Dr. Arya M. S.² and Professor Dr. Shaiju S. Dharan³**¹Pharm D. Intern, Ezhuthachan College of Pharmaceutical Sciences, Trivandrum, Kerala.²Assistant Professor, Department of Pharmacy Practice, Ezhuthachan College of Pharmaceutical Sciences, Trivandrum, Kerala.³Principal/Head of The Institution, Ezhuthachan College of Pharmaceutical Sciences, Trivandrum, Kerala.***Corresponding Author: Sruthi S. L.**

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Article Received on 05/01/2023

Article Revised on 26/01/2023

Article Accepted on 16/02/2023

ABSTRACT

Antibiotics are medicines used to prevent and treat bacterial infections and antibiotic resistance occurs when bacteria change in response to the use of these medicines. Community pharmacist play a critical role in preventing antibiotic resistance by dispensing antibiotics in a safe and rational manner and also by spreading awareness about the consequence of inappropriate use. So, it is essential to assess practice concerning antibiotic use and resistance and to describe current trends of antibiotic provision. The study was a cross-sectional observational study by using a self-administered questionnaire. The study was carried out for duration of 6 months within the community pharmacies of Thiruvananthapuram district of Kerala. Data were collected via validated self-administered questionnaire and were subjected to analysis through SPSS statistics 13.0 and R software 4.5.1. In our study a total 120 community pharmacists were contacted and requested to fill out the questionnaire through the direct visit of each community pharmacy. A total of 120 responses were collected, of which 118 responses were completed and used for analysis. Out of these respondents 71(60.2%) were females and 47(38.9%) were males. The age group 30-39 years constituted the highest proportion (39.8%). A total of 84 out of the 118 community pharmacist never dispensed antibiotic without a prescription. Regarding the type of antibiotics the pharmacist would really dispensed to a patient suffering from suspected bacterial infection without a prescription. Penicillin (42.6%) was the most selected class antibiotic followed by Macrolides (29.2%) and Cephalosporin (17.3%). We found no statistical significance between age, sex, qualification and experience with practice scores. Our study finding shows that community pharmacists of Thiruvananthapuram district of South Kerala majority have very good practice scoring and penicillin are most commonly dispensed antibiotics without prescription.

INTRODUCTION

According to WHO, "Antibiotics are medicines used to prevent and treat bacterial infections and antibiotic resistance occurs when bacteria change in response to the use of these medicines".^[1] Antibiotic resistance leads to higher medical costs, prolonged hospital stays and increased mortality. Community pharmacies are the first point of contact to patients who have a minor illness and can encourage appropriate antibiotic use and provide awareness of antibiotic resistance directly. Community pharmacists are the health professionals most accessible to the public and are a cornerstone of primary health care. Community pharmacist play a critical role in preventing antibiotic resistance by dispensing antibiotics in a safe and rational manner and also by spreading awareness about the consequence of inappropriate use. So, it is essential to assess practice concerning antibiotic use and resistance.

Schedule H includes drugs that shall be sold by retailer on prescription of the registered medical practitioners. Schedule H1 has been introduced to check indiscriminate use of antibiotics. This legal requirement is made to prevent self-medication of drugs.

Community pharmacies are undergoing a transformation from its traditional function as a supplier of medicines towards a pivot health destination. Moreover, community pharmacies are the first point of contact to patients who have a minor illness and can encourage appropriate antibiotic use and awareness of resistance directly. So, it is essential to assess practice concerning antibiotic resistance and use and to describe current trends of antibiotic provision.

MATERIALS AND METHODS

This study was a cross-sectional observational study using a self-administered questionnaire. Face- to face

interviews was used in this study as it was easy to distribute to potential participants. Population in this study was community pharmacists working in Thiruvananthapuram district of Kerala. The area had 412 community pharmacies which covers 32% of pharmacies in Kerala. It was expected to have at least one pharmacist during working hours.

Baraka P. Poyongo and Raphael Zozimus Sangeda. Pharmacists' Knowledge, Attitude and Practice Regarding the Dispensing of Antibiotics without Prescription in Tanzania: An Explorative Cross-Sectional Study. The sample size was calculated using the simple population formula based on above research with a prevalence of dispensing antibiotic without a prescription of 70, considering 95% confidence interval and 0.05% allowable error given the formula:

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

Where, n = sample size, Z = 1.96 for 95% confidence level, P = expected prevalence, d = allowable error. Sample size = 102 community pharmacy.

Data was collected from 120 community pharmacists, but only 118 responses were included in our study since 2 responses were incomplete.

Demographics section was developed to describe characteristics of community pharmacists and confirm inclusion criteria of sampling. This section includes three main questions about personal background, education and professional experiences.

- Personal background (age, sex); to describe general characteristic of participants
- Education profiles (Pharmacy degree, highest education): to examine various types of pharmacy degree in Kerala and confirm that the participants have graduated with a pharmacy degree as per inclusion criteria.
- Professional Experiences: to examine experiences of community pharmacists that might influence their knowledge, attitude and practice.

Practice section aims to investigate pharmacists' current actions of antibiotic dispensing in pharmacies according to their knowledge and attitudes. In this section, 11 items were used to measure the practice of community pharmacists. These items had response options on a 5-point Likert scale: (1) always, (2) never and (3) sometimes.

Current trends aim to explore the current situation of antibiotics provision in community pharmacy in Thiruvananthapuram.

ETHICAL CONSIDERATION

Written informed consent was obtained and clearance for the study was obtained from the scientific and ethical committee constituted in Ezhuthachan College of Pharmaceutical Sciences, Marayamuttom, Neyyattinkara, Thiruvananthapuram under protocol number: 141/2021.

RESULTS

1. SOCIO DEMOGRAPHIC DETAILS

1.1 Sex wise distribution

Majority of the community pharmacists enrolled in to the study were females 71(60.2%) followed by males 47 (39.8%).

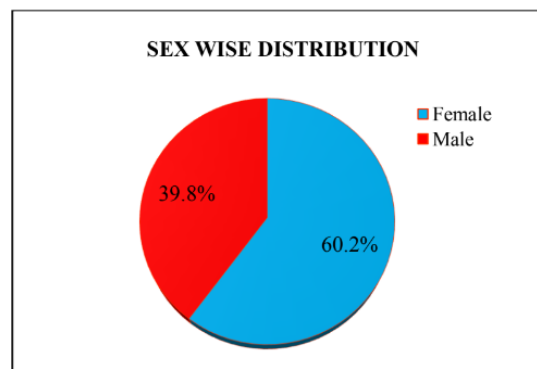


Fig 1.1: Sex wise distribution.

1.2 Age wise distribution

Among 118 participants, majority were in the age group of 30 – 39 years (39.8%) followed by 20 – 29 years (31.4%) and least were in the age group > 50 years (13.6%).

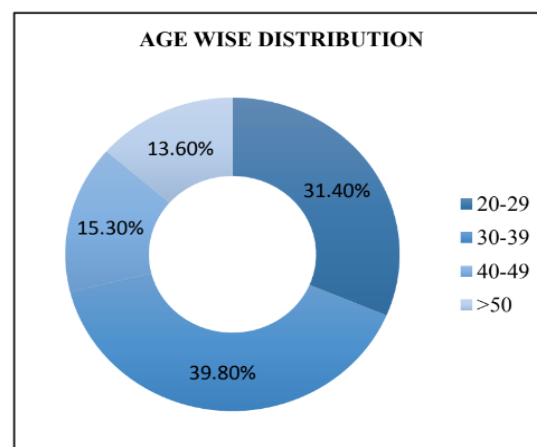


Fig. 1.2: Age wise distribution.

1.3 Qualification wise distribution

Among the candidates 80.5% were D Pharm holders and the remaining 19% of participants hold other pharmacy degrees.

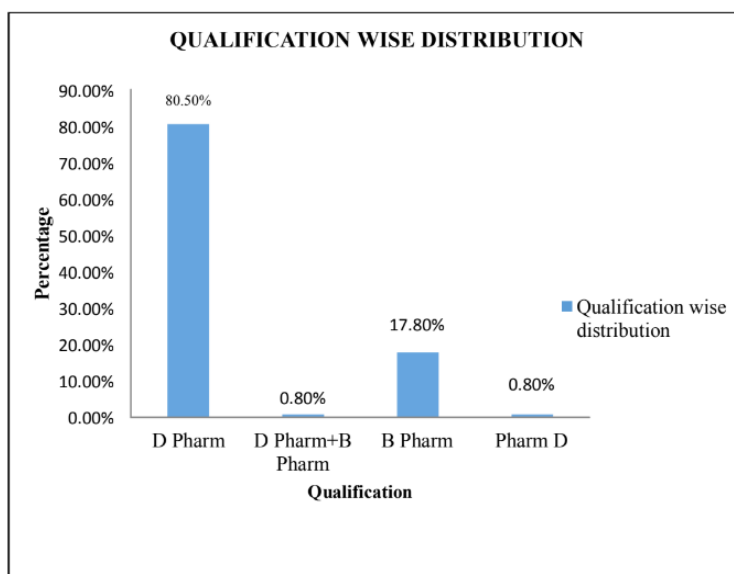


Fig. 1.3: Qualification wise distribution.

1.4 Experience wise distribution

36.4% had <5 years of experience and only 24.6% had >15 years of experience as community pharmacist.

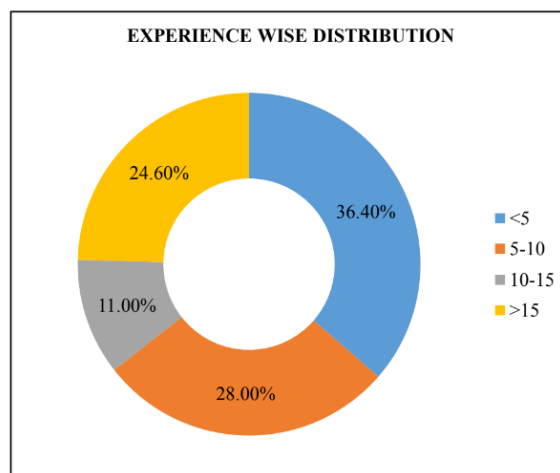


Fig 1.4: Experience wise distribution.

PRACTICES IN ANTIBIOTIC USE AND RESISTANCE

Table 1: Respond of community pharmacist towards antibiotic uses and resistance.

QUESTIONNAIRE	ALWAYS n=118(%)	NEVER n=118(%)	SOMETIMES n=118(%)
P1: I dispense antibiotics to all age group even if they present without a prescription	9(7.6)	85(72.3)	24(20.3)
P2: I ask the patient whether they are taking any other medication for the same complaint while dispensing antibiotics without prescription	72(61.0)	23(19.5)	23(19.5)
P3: I ask the patient whether they are allergic to some medicines before dispensing.	95 (80.5)	5(4.2)	18(15.3)

P4: Before dispensing antibiotics I ask the patient about their symptoms of infection	81(68.6)	3(2.5)	34(28.8)
P5: Patient is given adequate awareness on the use of antibiotics and resistance related issues while dispensing.	70(59.3)	7(5.9)	41(34.7)
P6: Antibiotics are screened with antibiotic guidelines before dispensing.	40(33.9)	35(29.7)	43(36.4)
P7: Antibiotics are dispensed for duration longer than that prescribed by the physician upon request of the patient.	20(16.9)	65(55.1)	33(28.0)
P8: I participate in antibiotic campaigns to promote optimal use of antibiotic	15(12.7)	46(40.0)	57(48.3)
P9: I dispense antibiotics without prescription for geriatric and paediatric patients with severe infection	1(0.8)	104(88.1)	13(11.0)
QUESTIONNAIRE	YES n=118 (%)	NO n=118 (%)	
P10: I refer paediatric, geriatric patients and pregnant women to specialist for proper treatment	114 (96.6)	4 (3.4)	

P11: Reason for dispensing antibiotics without prescription.

P11	FREQUENCY (n=118)	PERCENTAGE(%)
Pharmacists have good awareness about antibiotic use	49	29.0
Patients do not want to see a doctor unless the infection is serious	27	16.0
Increased sales and profit pressure from the owner	4	2.4
Patients cannot afford to consult a physician	26	15.4
Fear of losing a client/patient	9	5.3
Lack of awareness of pharmacist about rules, regulations and knowledge against dispensing antibiotics without prescription	39	23.1
No response	15	8.9
TOTAL	169	100

The main reasons for dispensing antibiotics without prescription was, pharmacist had good awareness about antibiotic use (29%), followed by lack of awareness of pharmacist about rules, regulations and knowledge against dispensing antibiotics without prescriptions (23.1%) and for 2.4% the reason was increased sale and profit pressure from the owner.

Practice scoring level in antibiotic use and resistance
32.2% had excellent, 17.8% had good, 39% had very good, 9.3% had poor and only 1.7% had a very poor score in practice.

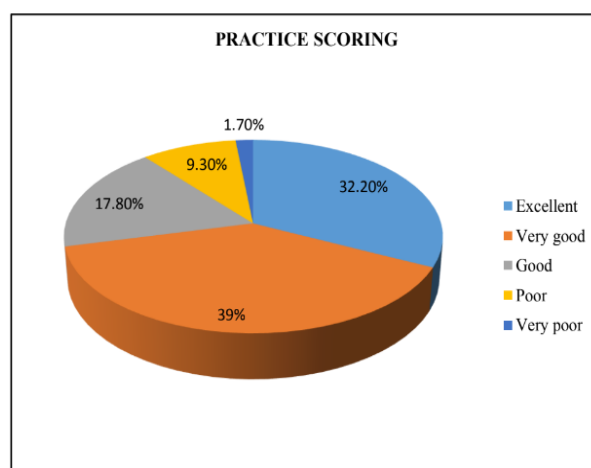


Fig. 1.5: Practice scoring concerning antibiotic use and resistance among Community pharmacists.

Distribution of age against practice Scoring

From the data it was clear community pharmacist in the age group of 30-39 had excellent practice scoring. This indicated that there was no significant correlation between practice and age; chi square value and p value were 7.4 and 0.60 respectively.

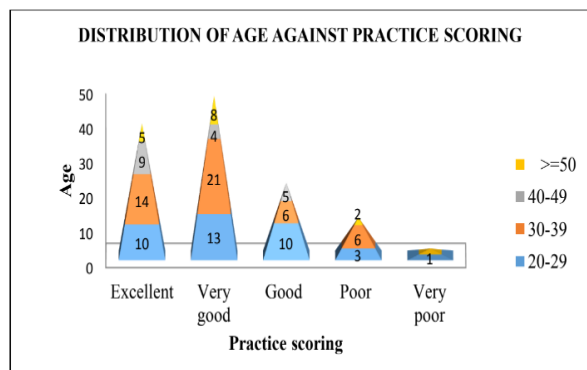


Fig. 1.6: Distribution of age against practice scoring.

Distribution of sex against Practice Scoring

Female pharmacist had an excellent practice scoring. There was no significant correlation between sex and practice. The chi square value and p value were 4.9 & 0.29 respectively.

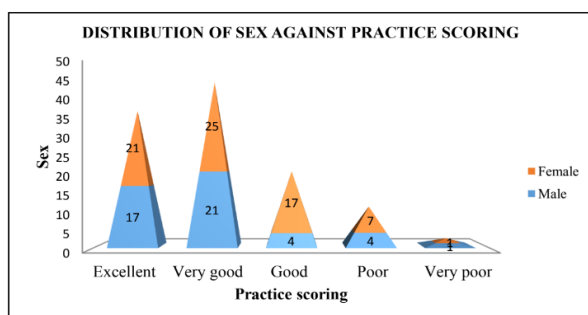


Fig. 1.7: Distribution of sex against Practice Scoring.

Distribution of qualification against Practice Scoring

It was evident that D Pharm graduates had excellent practice scoring. This shows that there was no correlation between qualification and practice. Chi square value and p value were 10 and 0.61 respectively.

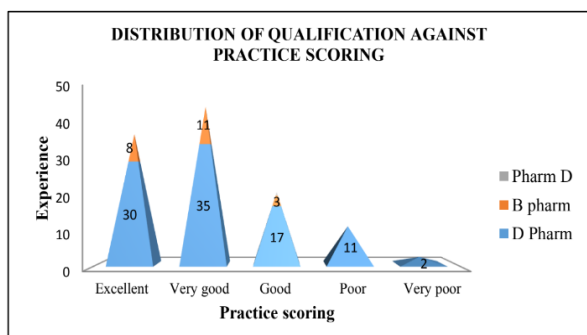


Fig. 1.8: Distribution of qualification against Practice Scoring.

Distribution of experience against Practice Scoring

Senior pharmacists were extensively experienced in community pharmacy practice setting. There was no correlation between experience and practice. Chi square value and p value were 10.54 and 0.57.

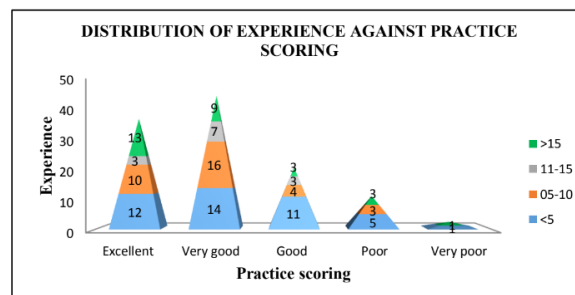


Fig. 1.9: Distribution of experience against Practice Scoring.

CURRENT TRENDS

Questions related to antibiotic dispensed without prescription were included to explore current trends of antibiotic provision in community pharmacy. The participants confirmed the number of antibiotics dispensed per day, age group commonly dispensed with antibiotics and commonly dispensed antibiotic dosage form without prescription.

Number of antibiotics dispensed per day

Mostly <25 antibiotics were dispensed by community pharmacy per day.

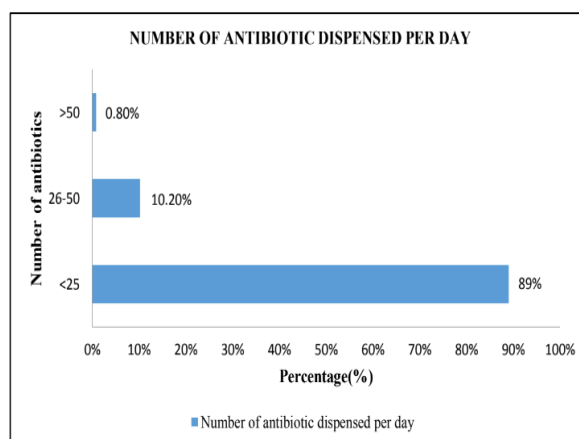


Fig. 2.0: Number of antibiotics dispensed per day.

Antibiotic commonly dispensed

Penicillin antibiotics (42.60%) were most commonly dispensed followed by Macrolides (29.20%), Cephalosporin (17.30%), Tetracycline (5.9%) and Quinolones (3.5%) without valid prescription.

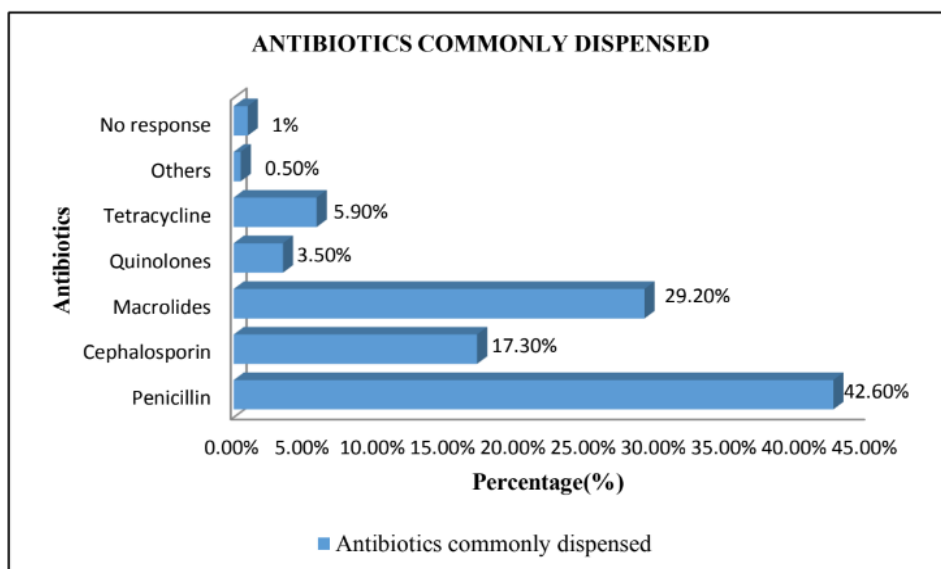


Fig. 2.1: Antibiotic commonly dispensed.

Disease condition

The disease for which antibiotics commonly dispensed without valid prescription was sore throat (25.5%) followed by fever (17.9%), cough (12.8%), running nose

(11.1%), dental pain (10.20%), acute diarrhea (9.4%) and other conditions such as UTI (1.7%). Only a few respondents (1.2%) were not dispensing antibiotics without a valid prescription.

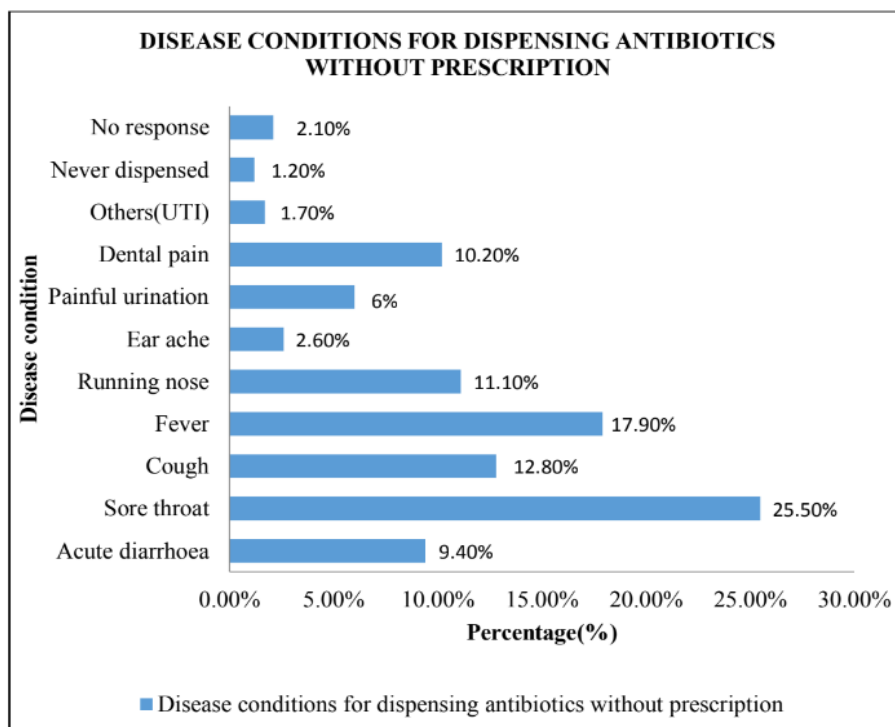


Fig. 2.2: Disease condition for which dispense antibiotic without prescription.

Age group

The age group for which antibiotics commonly dispensed without valid prescription were adults (86.4%) followed by geriatric (5.1%).

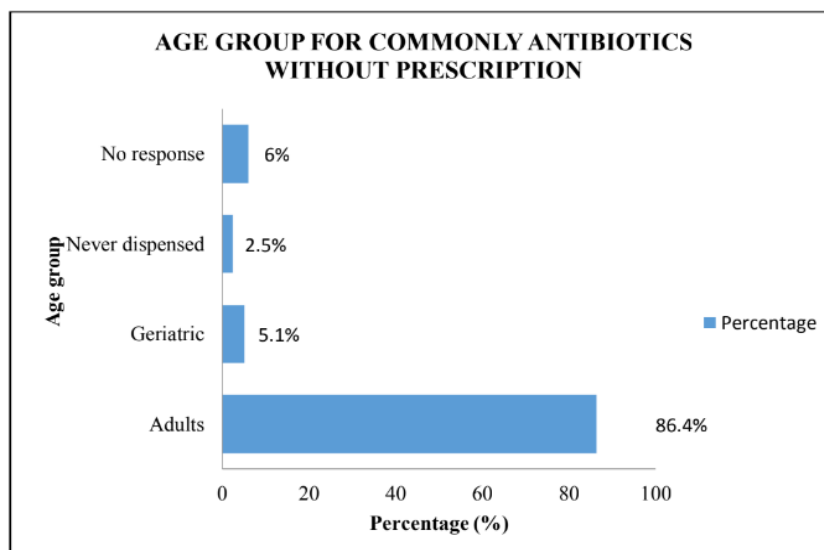


Fig 2.3: Frequency of antibiotic dispensing within in different age groups.

Dosage form

The antibiotic dosage form commonly dispensed without valid prescription was oral (62.8%) followed by topical (24.3%), eye drops (3.5%) and ear drops (0.7%).

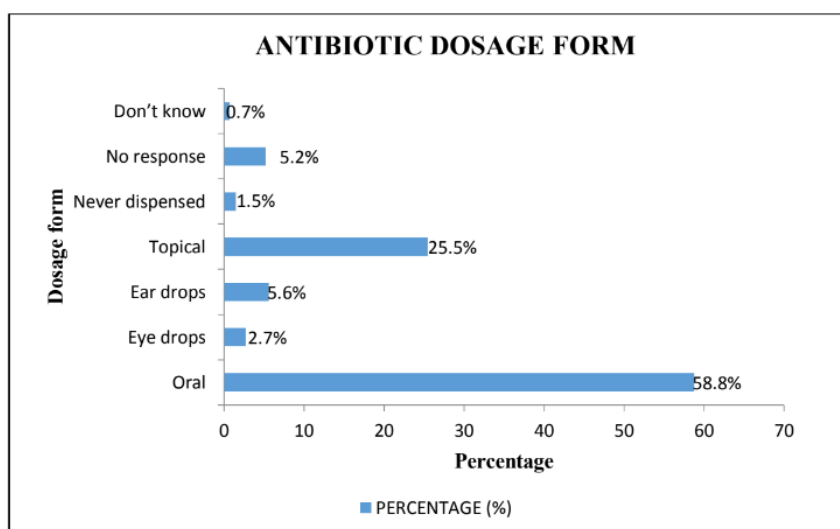


Fig. 2.4: Frequency of antibiotic dosage form dispensing without prescription.

DISCUSSION

Our study included a higher proportion of female respondents (60.2%), similar to the study of Mario Gajdacs *et al.*,^[49] In our study, majority of respondents were D Pharm graduates and D Pharm was the least qualification for working as a registered pharmacist, which was contrary to the study of Baraka P. Poyonga *et al.*,^[48] which showed that B Pharm was the least qualification for working as a registered pharmacist. Most of the respondents in our study were newly graduated pharmacist (D Pharm), which was similar to the study of Baraka P. Poyonga *et al.*^[48]

In our study, it was found that 54.2% of community pharmacist had excellent knowledge on antibiotic use

and resistance which was not related to sex and qualification, contrast results were found in other studies Anant Nepal *et al.*,^[50] Our study suggest that around one third of respondents dispense antibiotic without prescription, this findings were similar to the study of Nikita Goswami *et al.*,^[51] and one third were unaware about inappropriate antibiotic dispensing could promote antibiotic resistance. In our study 11.0% participants strongly agreed that they refused dispensing antibiotic without prescription would negatively affect sales and profit which was similar to the study of Muhammad Umair Khan *et al.*,^[54] where business pressures influenced the pharmacist to dispense antibiotics without prescription. The majority of the community pharmacist in our study never dispensed antibiotic for duration

longer that is prescribed by the prescriber or upon the request of patient which was similar to study of Dilruba Nazirn et al.

In our study about 12.7% of the community pharmacist always participated in antibiotic awareness campaign to promote optimal use of antibiotic which was contrary to the result of Steward Mudenda et al.^[56] were majority of participants rarely participated in antibiotic awareness campaign. In our 59.3% of community pharmacist always educated the patient about antibiotic resistance which was similar to the result of Yu Fang et al.,^[57] Most of pharmacies dispensed <25 antibiotics per day. In our study Penicillin was the commonly dispensed antibiotic without prescription followed by Macrolides and Cephalosporin. The results were similar to information on data base of CDDEP 2021.^[58] Adult patients were mostly approaching pharmacies for antibiotic without prescription, for the complaints of sore throat.

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