

A STUDY ON THE ASSESSMENT OF COMMUNITY PHARMACISTS IN THE IDENTIFICATION AND REPORTING OF ADVERSE DRUG REACTIONS IN THE MANAGEMENT OF RESPIRATORY TRACT INFECTIONS IN THE SOUTHERN PART OF KERALA**Nithin Manohar R.^{1*}, Ancy T. S.², Akhila S. P.², Anaswara A.², Anjana U. J.³ and Prasobh G. R.⁴**¹Professor and HOD, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.²Student, Final Year B Pharm, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.³Assistant Professor, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.⁴Principal, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.***Corresponding Author: Nithin Manohar R.**

Professor and HOD, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.

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ABSTRACT

A study was conducted to assess the Adverse Drug Reaction Awareness and knowledge, attitude and practice of respiratory tract infection therapy in community pharmacies at Southern part of Kerala. In this study, we analyse the Adverse Drug Reaction Awareness, knowledge, attitude and practice of respiratory tract infection therapy in community pharmacies. The knowledge attitude and practice were assessed by using suitably designed questionnaire. This study evaluates the Adverse Drug Reaction (ADR) awareness and the knowledge, attitude, and practice (KAP) of community pharmacists regarding the management of respiratory tract infections (RTIs) in Southern Kerala. Data was collected from 100 community pharmacies involving 162 pharmacists. The study aimed to assess the ADR awareness and overall management of RTIs before and after counselling. Demographic data showed a higher percentage of male pharmacists (60.5%), with a significant proportion of younger pharmacists in the 20-30 age group (48%). Pharmacists above the age of 50 showed a lack of knowledge regarding the latest ADR reporting guidelines and the side effects of RTI therapies. The study also revealed that most community pharmacists were qualified with a Diploma in Pharmacy (65%). Initially, the pharmacists' knowledge of ADRs and RTI therapy was below average, highlighting the need for counselling on ADR awareness and the risks associated with RTI therapy. After counselling, significant improvements were observed in the knowledge, attitude, and practice of pharmacists concerning ADRs and RTI therapy. The knowledge of ADRs related to RTIs increased from 46% to 83%, and knowledge of RTI therapy improved from 63.3% to 88.4%. Attitude scores rose from 38% to 57.9%, and practice scores increased from 44.1% to 60.4%, with all improvements being statistically significant (p -value < 0.05). The most commonly dispensed drugs for RTIs were antibiotics (52%), followed by corticosteroids (17%) and bronchodilators (13%). The study highlights the positive impact of providing ADR awareness and information on the use and side effects of RTI therapy through a counselling through leaflet. It concludes that improving ADR identification, reporting, and understanding of RTI therapy significantly enhances community pharmacists' knowledge, attitude, and practice towards RTI therapy management.

KEYWORDS: KAP, Adverse Drug Reactions, Questionnaire, Community Pharmacy.**INTRODUCTION**

The respiratory tract is complex organ system and mainly composed of mucosa, submucosa, and outer membrane, the second-largest mucosal surface area in the human body.^[1] Structurally, the respiratory tract can be divided into the upper respiratory tract, which includes the nose, pharynx, and larynx, and the lower

respiratory tract, comprising the trachea, bronchi, bronchioles, and alveoli.^[2] As the respiratory tract is an open organ, it is constantly exposed to chemicals, particles, allergens, and microorganisms from external environments, resulting in the occurrence of infectious disease.^[3] In contrast to traditional systemic drug delivery methods that involve injection, respiratory drug

delivery through inhalation is non-invasive, highly effective, and associated with fewer side effects.^[4]

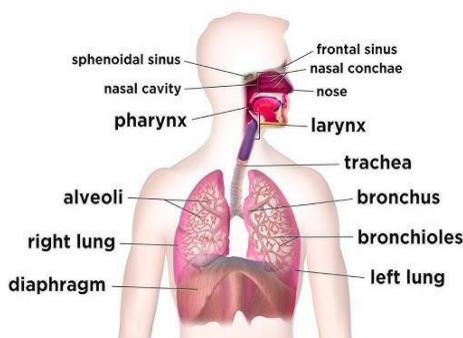


Fig. no. 1: Respiratory Tract.

Furthermore, respiratory delivery offers the potential to transport drugs to the brain through the nasal-to-brain route or into the systemic circulation via blood capillaries.^[5] Respiratory drug delivery provides a rapid and safe means to administer various therapeutic agents, nasal, bronchus, and lung quickly and safely, including small molecules, proteins, nucleic acids, nanoparticles, polymeric based drugs and even microbes.^[6] However, the administration of drugs through respiratory inhalation necessitates specialized devices, including dry powder inhalers, metered-dose inhalers, soft mist inhalers, nebulizers, and sprays. Currently, respiratory inhaled drugs encompass a variety of formulations such as dry powder, wet aerosols,

liposomal preparations, polymeric formulations, nanoparticles, and bacteriophage-based delivery systems. Extensive work has been done on both formulations and devices for improving their drug dispersion and absorption rates, with an aim to enhance therapeutic efficacy.^[7]

Respiratory tract infection (RTI) is defined as any infectious disease of the upper or lower respiratory tract. Upper respiratory tract infections (URTIs) include the common cold, laryngitis, pharyngitis/tonsillitis, acute rhinitis, acute rhinosinusitis and acute otitis media. Lower respiratory tract infections (LRTIs) include acute bronchitis, bronchiolitis, pneumonia and tracheitis.^[8]

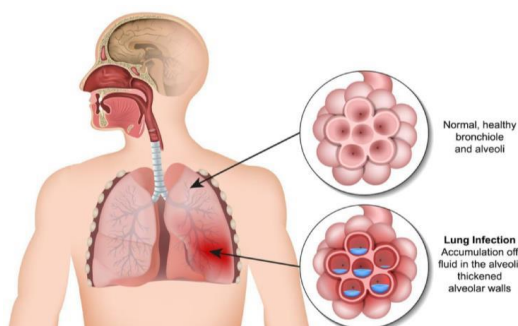


Fig no 2: Respiratory Tract Infection.

ADVERSE DRUG REACTIONS [ADRs]

An unintended and harmful reaction to a medicine that occurs at the normal dose for treatment. ADRs are a leading cause of death in many countries. The World Health Organization (WHO) in 1972, defines ADRs as "a drug-related event that is noxious and unintended".^[9] ADRs are unintended events that can occur after exposure to a drug, biological product, or medical device. They can lead to increased hospital stays, morbidity, and treatment costs, which can compromise patient safety. Pharmacists play a key role in detecting, monitoring, and reporting adverse drug reactions (ADRs).^[10]

METHODOLOGY

Study Duration: The study was conducted for a period of six months.

Study setting: The study was conducted among community pharmacies in southern part of Kerala.

Study design: A prospective observational study on Adverse Drug Reaction awareness and knowledge attitude and practice of respiratory tract infections will be conducted among pharmacists in southern part of Kerala.

Sample size: From the previous study, the proportion of knowledge, attitude and practice of the community pharmacists was reported as 43%. The margin of error or precision is assumed to be 8% with a significant level of 5%. The sample size of the qualitative cross-sectional study is calculated by the following formula.

Sample Size: $n = Z^2 P(1-P)/d^2 = 147$ samples needed for the study.

Where

Z_{α} – The standard normal variate with $\alpha\%$ level of significance

P- Estimated proportion of the cases

d- Precision or margin of error.

Study procedure

- A survey form was prepared to collect information about Adverse Drug Reaction Awareness and Knowledge Attitude and Practice in the management of respiratory tract infection therapy in community pharmacies in the southern part of Kerala.
- For this study a suitable structured questionnaire was prepared to elicit information about the Adverse Drug Reaction Awareness in the management of respiratory tract infection therapy.
- Analysing the information on Adverse Drug Reaction Awareness and knowledge attitude and practice in the management of respiratory tract infection therapy in community pharmacist.
- Educate and counsel the pharmacist with a leaflet containing all the information about respiratory tract infection and Adverse Drug Reaction identification and reporting.
- Again, after one month, a survey is conducted to collect the information about Adverse Drug Reaction Awareness and knowledge attitude and practice in the management of respiratory tract infection in community pharmacies in the southern part of Kerala.

- The data collected before and after the counselling of community pharmacists were analysed and overall analysis of the collected data was carried out.

Data collection tool: A questionnaire to collect information about the Drug Reaction and knowledge attitude and practice of respiratory tract infection therapy and two-time survey was conducted in community pharmacies in the southern part of Kerala.

Data analysis: After getting the data it will be analysed and suitably tabulated, formulated, verified.

RESULTS AND DISCUSSION

In the study the data on demographic characteristic Knowledge Attitude and Practices score were collected from 100 community pharmacies with 162 pharmacists. The collected data were subjected to statistical analysis. The correlation between Knowledge Attitude and Practices were assessed using bar graph. All the analysis were carried out with help of statistical software.

DEMOGRAPHIC CHARACTERISTICS OF COMMUNITY PHARMACIST

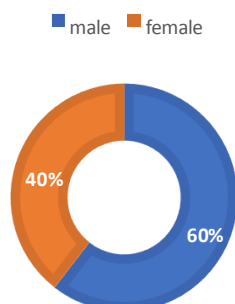
In this section demographic characteristic of community pharmacist were collected represents as bar graph or pie chart.

DISTRIBUTION OF COMMUNITY PHARMACIST BASED ON THEIR GENDER

Table 1: Distribution of community pharmacist based on gender.

SL NO	GENDER	FREQUENCY	PERCENTAGE
1	MALE	98	60.5%
2	FEMALE	64	39.5%

DISTRIBUTION OF COMMUNITY PHARMACIST BASED ON THEIR GENDER



GRAPH: 1

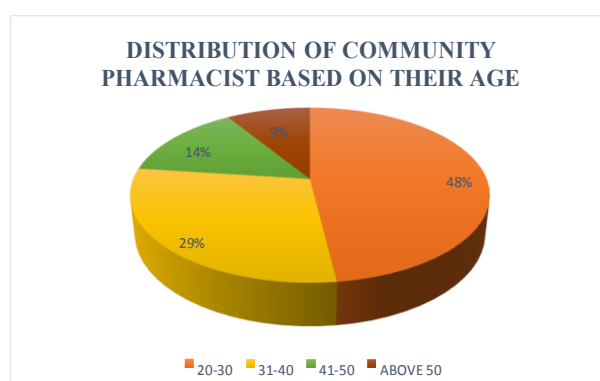
In this study 100 community pharmacies with 162 pharmacists were selected. For gender male community

pharmacist is higher than female community pharmacist. It was found that 60.5% of community pharmacist are male & 39.5% are females.

DISTRIBUTION OF COMMUNITY PHARMACIST BASED ON AGE

Table 2: Distribution of community pharmacist based on age.

SL NO	AGE	FREQUENCY	PERCENTAGE
1	20-30	78	48%
2	31-40	47	29%
3	41-50	22	14%
4	Above 50	15	9%



GRAPH: 2

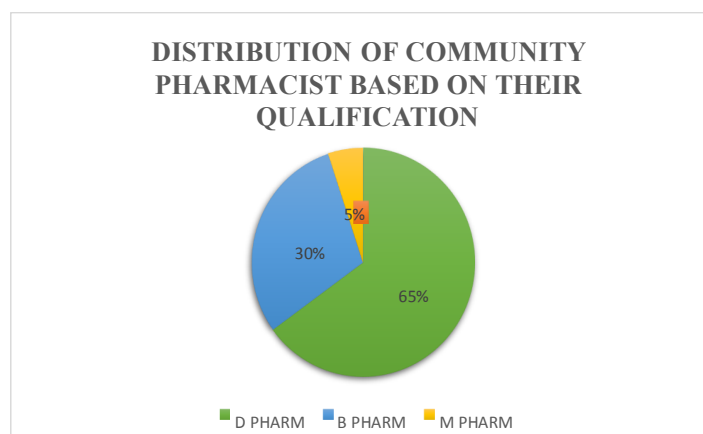
In this study 100 community pharmacies with 162 pharmacists were selected. From the table it shows the community pharmacist having age group between 20-30 are more in number. About 9% of community pharmacist

are above the age 50. About 29% of community pharmacist are from the age group 31-40. About 14% are from 41-50. About 9% of community pharmacist are from the age group above 50.

DISTRIBUTION OF COMMUNITY PHARMACIST BASED ON THEIR QUALIFICATION

Table 3: Distribution of community pharmacist based on their qualification.

SL NO	QUALIFICATION	FREQUENCY	PERCENTAGE
1	D PHARM	106	65%
2	B PHARM	48	30%
3	M PHARM	8	5%



GRAPH: 3

In this study 100 community pharmacies with 162 pharmacists were selected. From the study it was understood that the most of the community pharmacist were qualified with D.Pharm. About 65% of community pharmacist were qualified with D.Pharm. About 30% of the community pharmacist were B. Pharm holders and only 5% of community pharmacist are qualified with M. Pharm.

using the suitably designed questions. In this section scores on ADR assessment obtained from community pharmacies were selected and converted into percentage (%).

- Total number of pharmacies: 100
- Total number of pharmacists: 162
- Method: Questionnaire with Scoring method
- Number of questions includes: 5.

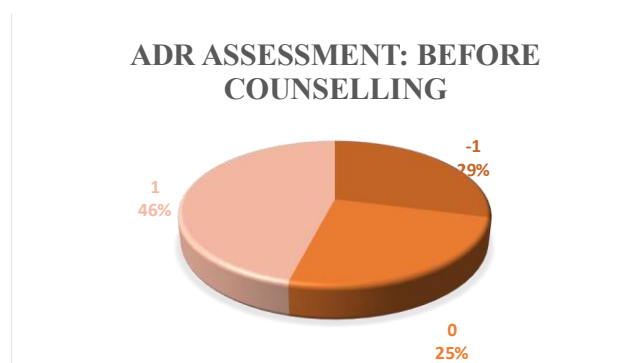
ADR ASSESSMENT IN THE MANAGEMENT OF RESPIRATORY TRACT INFECTIONS

ADR assessment in the management of Respiratory tract infections in community pharmacies were assessed by

ADVERSE DRUG REACTION (ADR) ASSESSMENT: BEFORE COUNSELLING

Table 1: ADR Assessment before counselling.

SL NO	QUESTIONS	SCORING		
		-1	0	+1
1	Are you aware of the Adverse Drug Reaction (ADR) associated with the management of Respiratory Tract Infection?	12	56	94
2	Have you ever seen an Adverse Drug Reaction (ADR) reporting form?	8	34	120
3	Are you able to recognize an Adverse Drug Reaction (ADR)?	55	62	45
4	Are you familiar with filling out an Adverse Drug Reaction (ADR) form?	18	29	115
5	Do you know the nearest Pharmacovigilance centre to report an Adverse Drug Reaction (ADR)?	139	19	4
	TOTAL	29%	25%	46%



Graph 1.

In our study 46% of community pharmacist have good knowledge about Adverse Drug Reaction Assessment in the management of Respiratory Tract Infections, 25%

have moderate knowledge and 29% have poor knowledge.

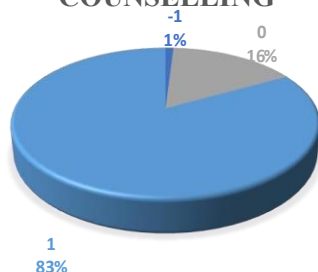
ADVERSE DRUG REACTION (ADR) ASSESSMENT: AFTER COUNSELLING

Table 2: ADR Assessment after counselling.

SL NO	QUESTIONS	SCORING		
		-1	0	+1
1	Are you aware of the Adverse Drug Reaction (ADR) associated with the management of Respiratory Tract Infection?	2	47	113
2	Have you ever seen an Adverse Drug Reaction (ADR) reporting form?	-	-	162
3	Are you able to recognize an Adverse Drug Reaction (ADR)?	4	60	98
4	Are you familiar with filling out an Adverse Drug Reaction	-	28	134

	(ADR) form?			
5	Do you know the nearest Pharmacovigilance centre to report an Adverse Drug Reaction (ADR)?	-	-	162
	TOTAL	1%	16%	83%

ADR ASSESSMENT: AFTER COUNSELLING



Graph 2.

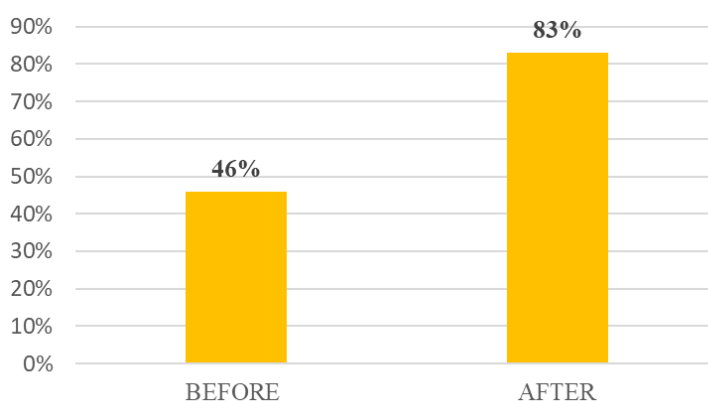
In our study 83% of community pharmacist have good knowledge about Adverse Drug Reaction Assessment in

the management of Respiratory Tract Infections, 16% have moderate knowledge and 1% have poor knowledge.

ADVERSE DRUG REACTION (ADR) ASSESSMENT: BEFORE COUNSELLING AND AFTER COUNSELLING

Table 3: ADR assessment before and after counselling.

SL NO	QUESTIONS	BEFORE COUNSELLING	AFTER COUNSELLING	P-VALUE
1	Are you aware of the Adverse Drug Reaction (ADR) associated with the management of Respiratory Tract Infection?	94	113	0.027*
2	Have you ever seen an Adverse Drug Reaction (ADR) reporting form?	120	162	0.001*
3	Are you able to recognize an Adverse Drug Reaction (ADR)?	45	98	0.002*
4	Are you familiar with filling out an Adverse Drug Reaction (ADR) form?	115	134	0.012*
5	Do you know the nearest Pharmacovigilance centre to report an Adverse Drug Reaction (ADR)?	4	162	0.001*
	TOTAL	46%	83%	0.0001*



Graph 3.

By comparing the overall knowledge of community pharmacists about ADR Awareness in the management of respiratory tract infections were found to be increased. The overall knowledge before counselling of community pharmacist was found to be 46% and it is increased to 83% after counselling.

KNOWLEDGE ATTITUDE AND PRACTICE OF RESPIRATORY TRACT INFECTION THERAPY IN COMMUNITY PHARMACIES IN THE SOUTHERN PART OF KERALA

The Knowledge Attitude and Practice of respiratory tract infection therapy in community pharmacies were

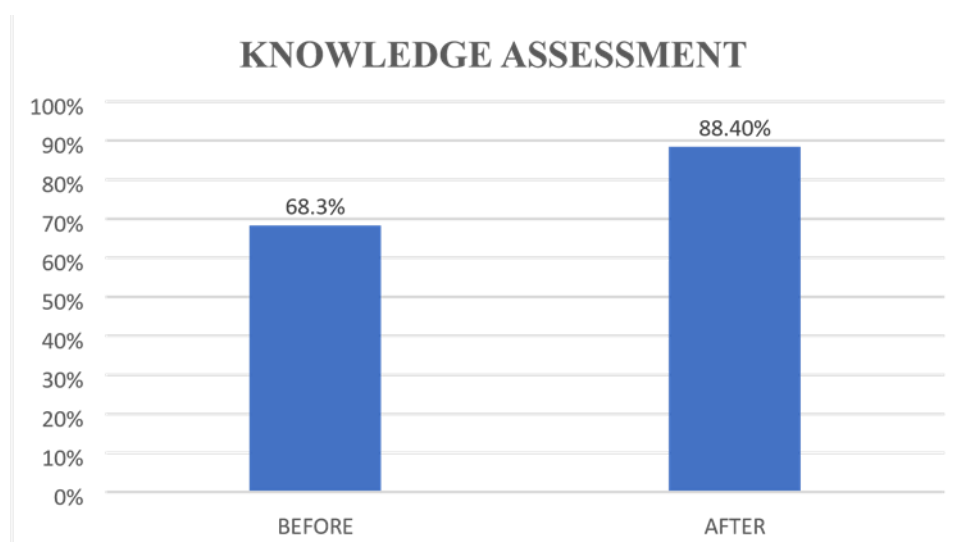
assessed by using the suitably designed questions. In this section scores on KAP obtained from community pharmacies were selected and converted into percentage (%).

- Total number of pharmacies: 100
- Total number of pharmacists: 162
- Method: Questionnaire with Scoring method
- Number of questions includes: 5.

KNOWLEDGE ASSESSMENT: BEFORE AND AFTER COUNSELLING

Table 4: Knowledge assessment before and after counselling.

SL NO	QUESTIONS	BEFORE SCORING			AFTER SCORING			P-VALUE
		-1	0	+1	-1	0	+1	
1	Do you know about respiratory tract infection?	-	-	162	-	-	162	NO
2	Do you know the difference between upper and lower respiratory tract infection?	44	58	60	7	40	115	0.001*
3	Do you believe that all respiratory tract infection drugs available in market are safe?	29	54	79	10	16	136	0.001*
4	Do you check expiry date of drugs before dispensing?	-	-	162	-	-	162	NO
5	Do you think the benefits of respiratory tract infection drugs is more than the potential risk?	30	42	90	6	15	141	0.001*
	TOTAL	12.7%	19%	68.3%	2.8%	8.8 %	88.4%	0.001*



Graph 4.

In our study, knowledge of community pharmacists about the management of respiratory tract infections were found to be increased. The overall knowledge before counselling of community pharmacist was found

to be 68.3% and it is increased to 88.4% after counselling. 88.4% of them have good knowledge, 8.8% have moderate knowledge and 2.8% have poor knowledge.

ATTITUDE ASSESSMENT: BEFORE AND AFTER COUNSELLING**Table 5: Attitude assessment before and after counselling.**

SL NO	QUESTION	BEFORE SCORING			AFTER SCORING			P-VALUE
		-1	0	+1	-1	0	+1	
1	Do you believe that respiratory tract infection therapy is generally safe?	-	65	97	-	66	96	0.912
2	Are you aware about the risk associated with the long-term use of respiratory tract infection therapy?	20	51	91	12	37	113	0.011*
3	Do you feel confident in your ability to manage respiratory tract infection therapy without professional guidance?	110	46	6	101	61	-	0.001*
4	Do you aware about the difference between the drug used in pediatric and geriatric patient?	65	42	55	40	38	84	0.001*
5	Do you know about the mechanism of action of antihistamines?	95	8	59	62	36	64	0.569
	TOTAL	35.8%	26.2%	38%	19.3%	22.8%	57.9%	0.003*

**Graph 5.**

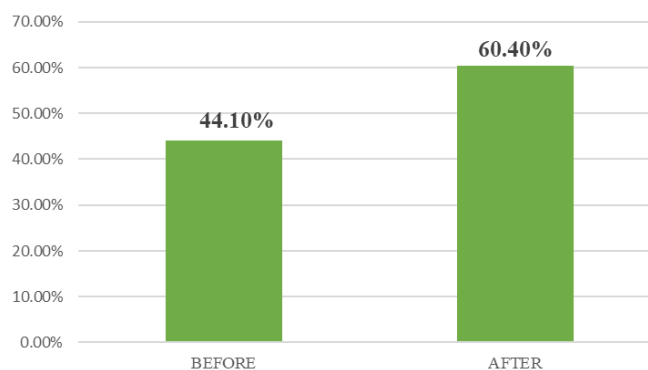
In our study, knowledge of community pharmacists about the management of respiratory tract infections were found to be increased. The overall knowledge before counselling of community pharmacist was found

to be 38 % and it is increased to 57.9% after counselling. 57.9% of them have good knowledge, 22.8% have moderate knowledge and 19.3% have poor knowledge.

PRACTICE ASSESSMENT: BEFORE AND AFTER COUNSELLING**Table 6: Practice assessment before and after counselling.**

SL NO	QUESTION	BEFORE SCORING			AFTER SCORING			PVALUE
		-1	0	+1	-1	0	+1	
1	Do you educate patient about respiratory tract infection therapy benefit and risk?	-	162	-	-	48	114	0.001*
2	Do corticosteroids is contraindicated to patients with Gastrointestinal irritation	66	-	96	-	64	98	0.818
3	Do you dispense Antibiotics without prescription?	162	-	-	162	-	-	No

4	Do you check expiry date of drugs before dispensing?	-	-	162	-	-	162	No
5	Do you think the benefits of respiratory tract infection drugs are more than the potential risk?	-	63	99	-	47	115	0.061
								0.004*
	TOTAL	28.1%	27.8%	44.1%	20%	19.6%	60.4%	



Graph 6.

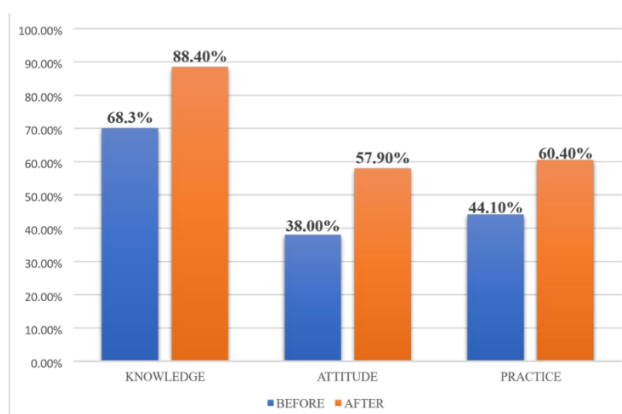
In our study, knowledge of community pharmacists about the management of respiratory tract infections were found to be increased. The overall knowledge before counselling of community pharmacist was found

to be 44.1% and it is increased to 60.4% after counselling. 60.4% of them have good knowledge, 19.6% have moderate knowledge and 20% have poor knowledge.

COMPARISON OF OVERALL ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE

Table 7: Overall assessment of Knowledge, Attitude and Practice.

KAP	BEFORE COUNSELLING	AFTER COUNSELLING	P-VALUE
KNOWLEDGE	68.3%	88.4%	0.001*
ATTITUDE	38%	57.9%	0.003*
PRACTICE	44.1%	60.4%	0.004*



Graph 7.

In our study, the overall assessment of knowledge attitude and practice of community pharmacists after counselling was found to be increased.

MOST DISPENSED CLASS OF DRUG FOR RESPIRATORY TRACT INFECTIONS: A COMPARATIVE STUDY

The rational use of medications plays a critical role in improving patient outcomes and optimizing healthcare

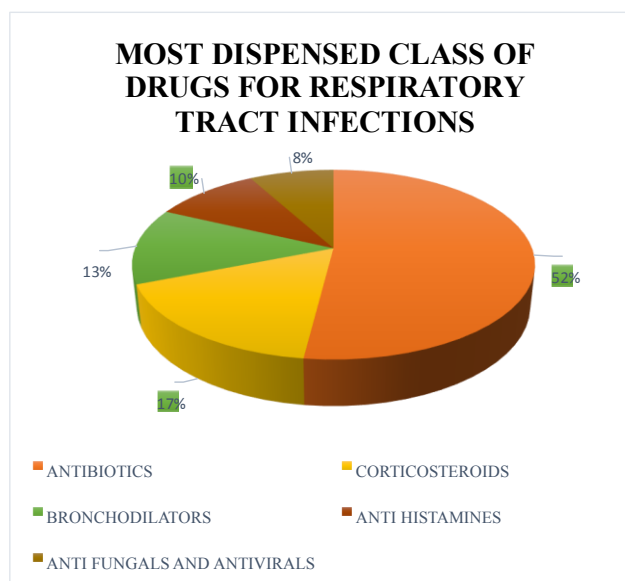
resources. The present study analyzes the dispensing patterns of various drug categories in a healthcare setting to assess the distribution and utilization trends. By analysing drugs dispensed across five categories, including antibiotics, corticosteroids, bronchodilators, antihistamines, antivirals and antifungals. Antibiotics accounted for the highest proportion (52%), reflecting their widespread use in managing infections. Followed, indicating the prevalence of other categories;

Corticosteroids (17%), bronchodilators (13%), antihistamines (10%), antivirals and antifungals (8%) contributed smaller percentages to the overall drug distribution. These data highlight the emphasis on infection control and respiratory management in this

setting, while also underscoring the need for judicious use to minimize resistance and adverse effects. This project aims to evaluate the dispensing trends of these drugs to promote rational prescribing practices, and enhance the quality of patient care.

Table 8: Most dispensed class of drugs.

SL NO	CATEGORY	NUMBER OF DISPENSED DRUG (n)	PERCENTAGE OF DISPENSED DRUG (%)
1	ANTIBIOTICS	52	52%
2	CORTICOSTEROIDS	17	17%
3	BRONCHODILATORS	13	13%
4	ANTI HISTAMINES	10	10%
5	ANTI VIRAL AND ANTIFUNGAL	8	8%



Graph 8.

RESULT

In our study, the most dispensed drugs for the management of Respiratory Tract Infection in community pharmacies were found to be antibiotics 52% and the least dispensed was found to be Antiviral and Antifungal 8%.

CONCLUSION

This study examines the awareness on Adverse Drug Reactions (ADRs) and knowledge, attitudes, and practices (KAP) on RTI management of community pharmacists in southern part of Kerala were increased by counselling through leaflets. Counselling and education about adverse drug reactions (ADRs) and Respiratory Tract Infections led to a significant improvement in their knowledge and practices. The study emphasizes the professional development for community pharmacists to enhance patient safety, reduce medication errors, and ensure proper drug use. From this assessment, as a pharmacist we played a significant role in providing Awareness on Adverse Drug Reactions (ADRs) and Respiratory Tract Infections management by

providing counselling to community pharmacist through leaflets and they have updated with latest guidelines.

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REFERENCE

1. K.D Tripathi, Essentials of medical pharmacology, sixth edition, 213-229.
2. Brittain-Long. R, Nord. S, Olofsson. S, Westin. J, Anderson, L.M. Lindh, M. J. Clin Virol Multiplex real-time PCR for detection of respiratory tract infections, 2008; 41: 53–56.
3. Tom Fahey, Nigel Stocks, Toby Thomas. Systematic review of the treatment of upper respiratory tract infection Archives of disease in childhood, 1998; 79 (3): 225-230.

4. Neemisha Jain, R Lodha, S K Kabra. Upper respiratory tract infections, *The Indian Journal of Paediatrics*, 2001; 68: 1135-1138.
5. Karen C Carroll. Laboratory diagnosis of lower respiratory tract infections: controversy and conundrums *Journal of clinical microbiology*, 2002; 40(9): 3115-3120.
6. Sumi Mehta, Hwashin Shin, Rick Burnett, Tiffany North, Aaron J Cohen Ambient. Particulate air pollution and acute lower respiratory infections: a systematic review and implications for estimating the global burden of disease, *Air Quality, Atmosphere & Health*, 2013; 6: 69-83.
7. Manmohan, Bhargava SK. Acute respiratory infection. *Indian Pediatric*, 1984; 211–213.
8. Huovinen P, Lahtonen R, Ziegler T, Meurman O, Hakkarainen K, Miettinen A. Pharyngitis in adults: the presence and coexistence of viruses and bacterial organisms. *Ann Intern Med*, 1989; 110: 612–616.
9. Awlins M, Thompson W. Mechanisms of adverse drug reactions. In: Davies D, ed. *Textbook of adverse drug reaction*. Newyork: oxford university press, 1977; 10.
10. Edwards IR, Aronson JK. Adverse drug reactions: definitions, diagnosis, and management. *Lancet.*, 2000; 356: 1255-259.