International Journal of Advanced Multidisciplinary Research and Studies

Retrospective Study on Prescription Pattern on the Management of Chronic Obstructive Pulmonary Disease (COPD)

[1] Bajracharya M, [2] Bajracharya D
[1] Department of Pharmacy, Manmohan Memorial Institute of Health Sciences, Soalteemode, Kathmandu, Nepal
[2] ManMohan Memorial Institute of Health Sciences, Soalteemode, Kathmandu, Nepal

Corresponding Author: **Bajracharya M**

Abstract

Background: COPD is a disease caused by chronic bronchitis, emphysema, or combination of both conditions. As per the Global Burden of Disease 2017 prediction, COPD is the second leading cause of death in Nepal, the fourth leading cause of premature death and the third cause for disability-adjusted life years (DALYs) in Nepal. The prevalence of COPD in Nepal was 11.7%. If current situation prevails, the burden of COPD might increase continuously in the nation. Hence, the findings from this study might provide baseline information to medical and paramedical students and other researchers to conduct further study in similar area.

Objectives: The study was done to assess the prescription pattern for management of COPD in multispecialty hospital of Nepal.

Method: A retrospective study was conducted at 100 bedded multispecialty hospital located at Lalitpur, Nepal. A total of 200 inpatient records, from Baishak 2075 to Chaitra 2078 were reviewed and data was collected as per the objectives and analysed by using SPSS version 16 and MS Excel 2013.

Result: Out of 200 COPD patients studied, female patients (58%) were higher than male patients and maximum patients (42.5%) were from the age group 70-79. The most common symptom was shortness of breath (77.5%) followed by cough (50%) and fever (33.5%) Hypertension (38.5%) was the most frequent co morbidity seen among COPD patients followed by corpulmonale (20%) and diabetes mellitus type II (19%). Doxophylline was the most prescribed methylxanthines during hospitalization (47.5%) and discharge (51%) as well. Among inhalers, Tiotropium bromide and combination of Salbutamol and Fluticasone (52.5%) was prescribed most to the hospitalised patients. Hydrocortisone (68.5%) was the most prescribed corticosteroids during hospitalization where as Prednisolone (49.5%) was the most prescribed corticosteroids during discharge. 85.5% of patients were prescribed Ipratropium bromide for nebulisation in hospitalised patients. Pantoprazole (55.5%) was the most prescribed proton pump inhibitors followed by Rabeprazole (34%). Maximum patients (103) preferred Rotacap than metered dose inhaler (MDI) and dry powder inhaler (DPI). Azithromycin (52.5%) was most frequently prescribed antibiotics during hospitalization followed by ceftriaxone (85%), whereas among discharge patients, Cefpodoxime (35%) was most frequently prescribed antibiotics followed by Azithromycin (32%). The drugs prescribed with generic name were 31.31% and from essential drug list (EDL) was 37.72 %.

Conclusion: The prescription pattern of COPD was studied and found that Doxophylline, Tiotropium bromide, Hydrocortisone and Azithromycin were most prescribed methylxanthnes, antimuscarinic agents, corticosteroids and antibiotics respectively. The findings from the study showed that prescribing drugs with generic name and from EDL was low so prioritization on prescribing drugs by generic name and EDL needs to be encouraged.

1. Background of the study

Chronic Obstructive Pulmonary Disease (COPD) is the limitation of airflow that is not reversible and is usually progressive [1]. Chronic obstructive pulmonary disease (COPD) is caused by chronic bronchitis, emphysema, or combination of both conditions.

The signs and symptoms of COPD are as follows:
- Chronic cough with or without sputum production.
- Dyspnea.

According to the Global Burden of Disease (GBD) study, the prevalence of COPD was 3919 per 100,000 population globally and it was the third leading cause of global mortality in 2017. The prevalence of COPD in Nepal was 11.7% [2]. If current situation prevails, the burden of COPD might increase continuously in the nation [3].Misconceptions about this disease have led to under-treatment and under-funding, resulting in an increase in the burden of COPD. Hence, the findings might provide baseline information to medical and paramedical students and other researchers to conduct further study in similar area. COPD cases were studied at Star Hospital. Star Hospital is a 100 bedded multispecialty hospital established in 2007 A.D and is located at Sanepa, Lalitpur. Star Hospital followed GOLD Global Initiative for Chronic Obstructive Pulmonary Disease) Treatment Guideline for the management of COPD [4].

2. Materials & Methods
2.1 Type of the study: Retrospective study.

2.2 Study area: Star Hospital, Sanepa, Lalitpur Nepal.

2.3 Study population: Patients who were diagnosed with COPD and admitted to Star Hospital.

2.4 Sampling technique: Purposive sampling.

2.5 Criteria
- **Inclusion criteria:**
  - COPD patients admitted to the hospital from year Baishak 2075 to Chaitra 2078 were included.
- **Exclusion criteria:**
  - Cases of COPD patients who were expired during treatment were excluded.
  - Cases of patients who were referred to other hospital were excluded.
  - Cases of LAMA (Leave against Medical Advice) were also excluded.

2.6 Data collection process
The data collection form was approved by the supervisor. Required information was noted from the cardex report of patients in Data Collection Form such as name of the patient, age, sex, address, signs and symptoms, disease diagnosed and drugs used in the management.

2.7 Data Analyzing tools
SPSS 16 software and Microsoft Excel 2013.

2.8 Ethical consideration
- Approval was taken from the IRC of Manmohan Memorial Institute of Health Sciences (MMIHS).
- Approval was taken from Star Hospital.
- Privacy and confidentiality of the patients was maintained.

3. Results and Discussion
Out of 200 patients, following results were found and findings are presented through pie-chart, tabulations and bar graphs.

3.1 Distribution of COPD According to the Age of the Patients

Table 1: Age wise distribution

Age group	Frequency	Percent (%)
30-39	2	1
40-49	2	1
50-59	11	5.5
60-69	34	17
70-79	85	42.5
80-89	56	28
90-99	10	5
Total	200	100

Table 1 shows that out of 200 COPD patients who were admitted in Star Hospital, maximum patient (42.5%) were from age group 70-79. It was similar to study conducted by Sawant *et al*., found that a maximum number of COPD patients were from age group 61-70 years with minimum age being 34 years to be diagnosed with COPD [5].

3.2 Distribution of COPD According to Sex of the Patients

Table 2: Sex wise distribution

Sex of patients	Frequency	Percent (%)
Female	117	58.5
Male	83	41.5
Total	200	100

Table 2 shows that higher number of female patient (58%) were found than male patient (42%). It was similar to the study conducted by Adhikari *et al* that stated that the DALYs were found to be high among females(95%) than in males [3].

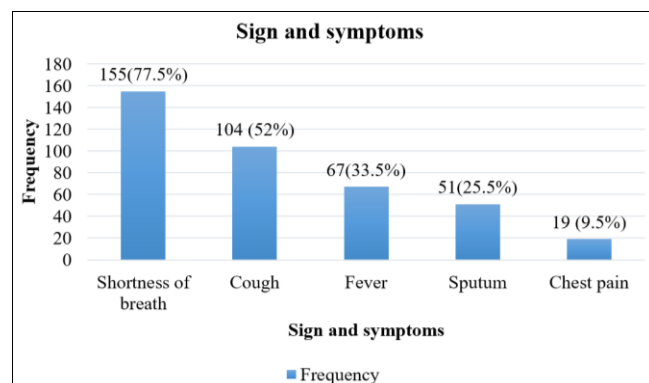## 3.3 Signs and Symptoms Reported by Patients

Fig 1: Sign and symptoms in patient

From Fig 1, it was found that out of 200 COPD patients, the most common symptoms were shortness of breath

(77.5%). According to study conducted by Kessler *et al*., a total of 92.5% of patients reported experiencing shortness of breath, cough, wheezing or chest tightness and shortness of breath was the most common symptom (72.5%) [6].

3.4 Diagnosis of COPD and Comorbidities among Patients

Table 3: Diagnosis of COPD and comorbidities

Diagnosis	Frequency	Percent (%)
COPD	200	100
AE of COPD	175	87.5
Hypertension	77	38.5
Cor Pulmonale	40	20
Diabetes Mellitus Type II	38	19
Respiratory Failure Type II	32	16
Pneumonia	25	12.5
Atrial Fibrillation	22	11
Hypothyroidism	20	10
Chest Infection	18	9
UTI	14	7
Chronic Kidney Disease	11	5.5
Tuberculosis	10	5
Benign Prostatic Hyperplasia	10	5
Bronchietasis	9	4.5
Osteoporosis	7	3.5
Anxiety and Depression	1	0.5

From Table 3, it was found that among 200 COPD patients, most patients were diagnosed with disease namely hypertension (38.5%) and cor pulmonale (20%). It was similar to research conducted by Kessler *et al*, that reported hypertension(42.8%) was the most frequent comorbidity among COPD patient [6].

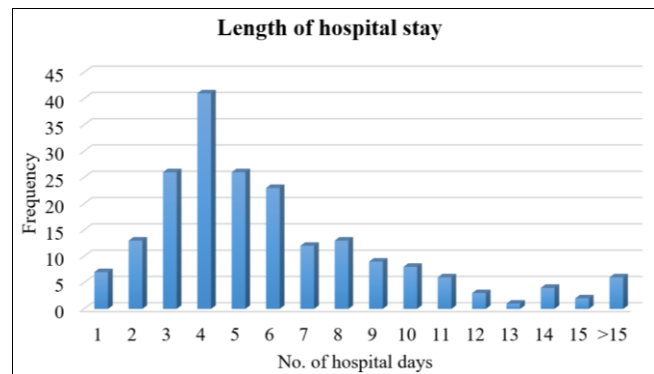## 3.5 Length of Patient Stay in Hospital

Fig 2: Length of patient stay in hospital

From Fig 2, it was observed that maximum number of hospital stay were 4 days followed by 3, 5 and 6 days. In the research conducted by Westbroek *et al*., it was observed that out of 752 patient, the median length of hospitalization was 5 days which was similar to our result [7].

3.6 History of COPD

Table 4: History of COPD

History of COPD	Frequency	Percent (%)
Yes	166	83
No	34	17
Total	200	100

From abovetable, it was observed that 83% patient had the history of COPD while 17% were new cases.

3.7 Medicines Prescribed in COPD Patients

Table 5: Methylxanthines prescribed during hospitalization

Methylxanthines	Frequency	Percent (%)
Doxophylline	95	47.5
Theophylline	6	3

Table 6: Methylxanthines prescribed during discharge

Methylxanthines	Frequency	Percent (%)
Doxophylline	102	51
Theophylline	6	3

From Table 5 and 6, it was observed that doxophylline (47.5%) was prescribed to maximum patients than theophylline during hospitalisation. In a study conducted by Gigi *et al*., it was observed that Doxophylline (56.89%) were the most prescribed methylxanthines [8].This study was similar to the study conducted by Cazzola, Mario *et al*. which concluded that Doxophylline is an effective bronchodilator for relieving airway obstruction in patients with asthma or chronic obstructive pulmonary disease (COPD), and displays a better safety profile with respect to theophylline [9].
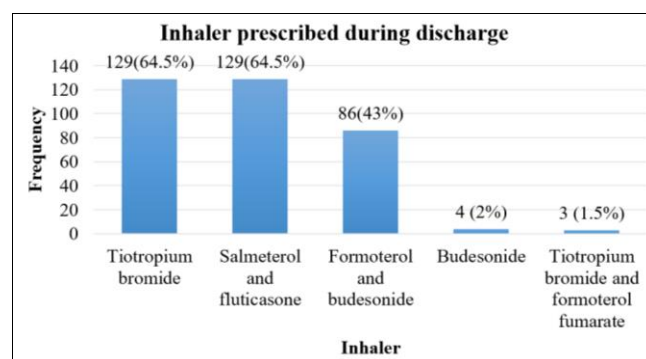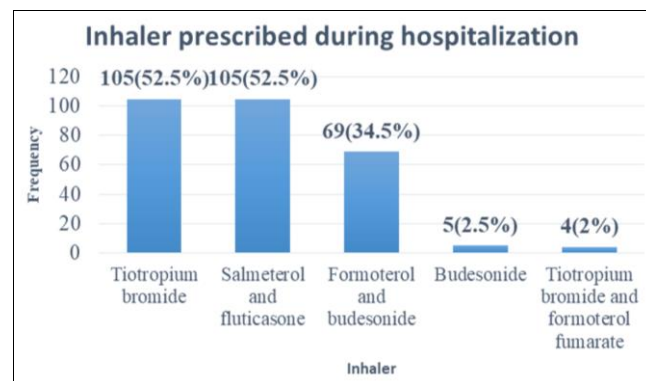

Fig 3: Inhalers Prescribed

Out of 200 COPD patient, Tiotropium bromide and combination of salmeterol and fluticasone were prescribed most (52.5%). According to study conducted by Maqusood *et al*., that stated that Tiotropium bromide were prescribed to 39.18% patient and budesonide were prescribed to 54.05% patient [10].The findings of the study by Chen, Andrea M *et al*. showed that Tiotropium was the best option as a first-line drug for patients with moderate-to-severe COPD because of its ability to sustain bronchodilator effect, improve quality

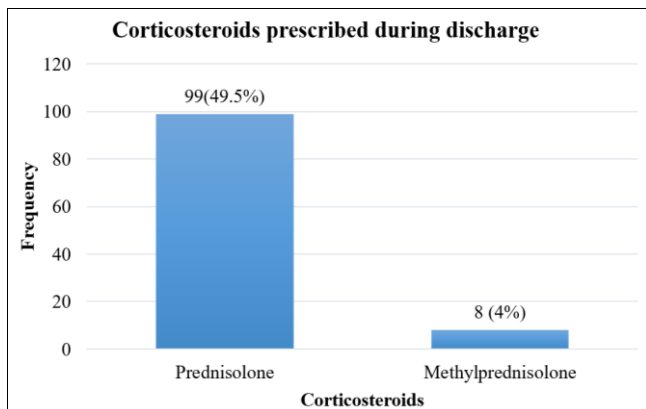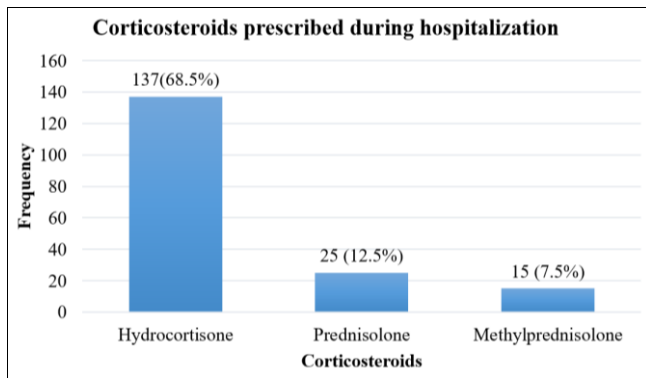of life and reduce COPD exacerbations [11].

Fig 4: Corticosteroids Prescribed

It was observed that most prescribed corticosteroids were hydrocortisone followed by prednisolone. According to research conducted by Padwal *et al*., it was observed that 26.3% of patient were prescribed hydrocortisone [5]. According to study conducted by Maqusood *et al*., it was observed that 2.70% patient received methylprednisolone during the treatment of COPD [10].
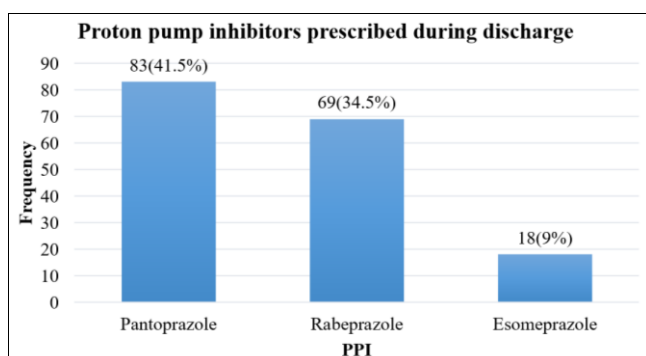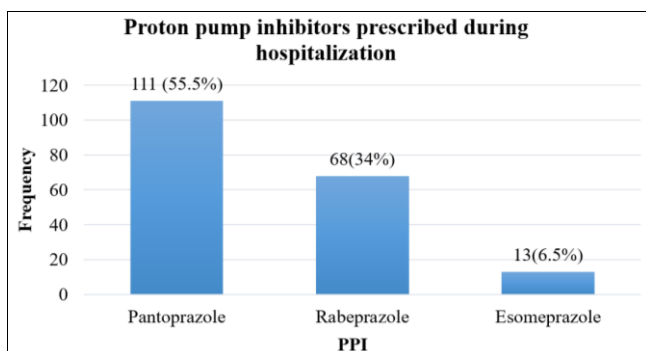

Fig 5: PPI Prescribed

It was observed that maximum patients were prescribed pantoprazole followed by rabeprazole and esomeprazole.
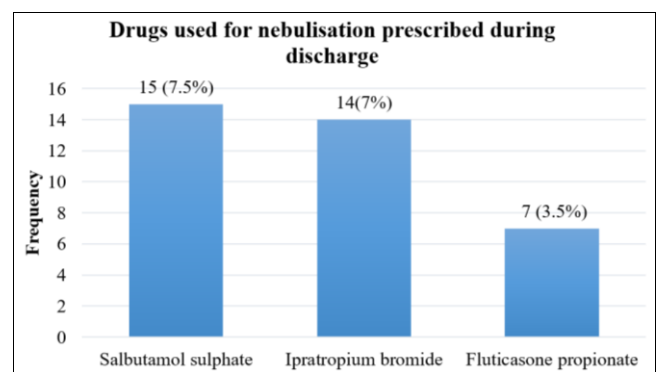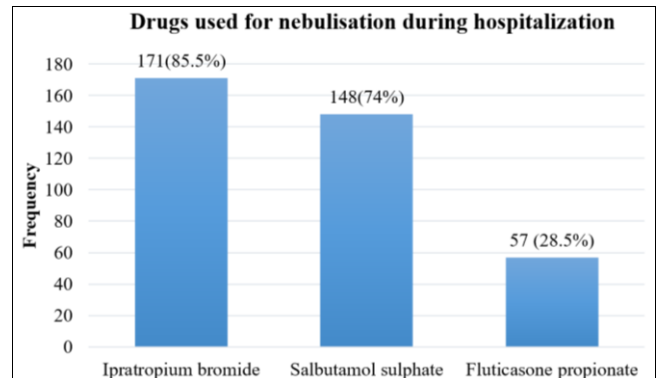

Fig 6: Drugs used for nebulisation prescribed

It was observed that most drugs used for nebulisation prescribed was Ipratropium bromide. It was similar to research conducted by Sawant *et al*. which found that ipratropium bromide (84.5%) were prescribed in COPD patients [5]. In a study conducted by Maqusood *et al*., it was observed that ipratropium bromide was prescribed to 52.70% patient, salbutamol was prescribed to 64.86% patients and fluticasone propionate was prescribed to 2.70% patients [10].

Table 7: Inhaler prescribed

Inhalers	Rotacap	MDI	DPI
Tiotropium bromide	103	30	3
Formoterol and budesonide	65	22	1
Salmeterol and fluticasone	61	14	2
Budesonide prescribed	3	1	0
Tiotropium bromide and Formeterol fumarate	3	1	0

From the table, it was observed that maximum patients preferred Rotacap than MDI and DPI. This was similar to the findings by Pover *et al*. that also observed that out of 395 patient, 160 patient preferred rotacap [13].

Table 8: Antibiotics prescribed during hospitalization

Antibiotics	Frequency	Percent (%)
Azithromycin	105	52.5
Ceftriaxone	85	42.5
Piperacillin and tazobactum	49	24.5
Levofloxacin	33	16.5
Cefoperazone	26	13
Cefuroxime	26	13
Meropenem	21	10.5
Cefepime	19	9.5
Clindamycin	18	9

Amoxycillin and clavulanic acid	18	9
Amikacin	14	7
Linezolid	9	4.5
Cefpodoxime	7	3.5
Moxifloxacin	6	3
Teicoplanin	6	3
Cefixime	5	2.5
Imipenem and cilastin	3	1.5
Norfloxacin	3	1.5
Imipenem and cilastin	3	1.5
Doxycycline	3	1.5
Ciprofloxacin	2	1
Aztreonam	1	0.5

Table 9: Antibiotics prescribed during discharge

Antibiotics	Frequency	Percent (%)
Cefpodoxime	70	35
Azithromycin	64	32
Cefixime	30	15
Cefuroxime	26	13
Levofloxacin	20	10
Amoxycillin and clavulanic acid	15	7.5
Linezolid	8	4
Clindamycin	7	3.5
Moxifloxacin	5	2.5
Norfloxacin	3	1.5
Ciprofloxacin	2	1
Meropenem	1	0.5
Doxycycline	1	0.5
Tigecycline	1	0.5

From table, we found that Azithromycin and Ceftriaxone were highly prescribed antibiotics. The result was similar to the study conducted by Kumar *et al*. that concluded that Azithromycin was most frequently used (55.29%) [14]. According to study conducted by it was observed that Karunakar *et al*., Ceftriaxone were prescribed to 17.53% patient [15]. It was similar to study conducted by Dwivedi *et al*., where it was observed that Piperacillin and Tazobactum was prescribed to 20.12%, Amoxicillin and clavulanic acid was prescribed to 11.68% of patients [15]. The result was similar to the study conducted byErnst, Pierre *et al*. it concluded that among 203,642, frequency of fluoroquinolone use, mostly levofloxacin and moxifloxacin, ranged from 8% to 32% of AECOPD antibiotic prescriptions [16]. According to the study conducted by Huckle, Anthony W *et al*. among 301 patient, Cefpodoxime was as safe and well tolerated in the treatment of acute exacerbation of COPD [17]. According to study conducted by Todd *et al*., it stated that the macrolide class of antibiotics showed anti-inflammatory properties with relevance to COPD and considered as a potential therapy in COPD [18]. According to the research conducted by Kato *et al*, in total of 1239 patients, clinical cure and microbiological eradication rates were significantly increased in patients treated with Linezolid [19].

3.8 WHO Core Drug Prescribing Indicators

Prescription Indicators	Values	WHO standard values
Average number of drugs prescribed per prescription	10.82	<2
Percentage of drugs prescribed by generic name	7.78%	100%
Percentage encounter with an antibiotic prescribed	31.31%	20-26.8%

Percentage of drugs prescribed from EDL or formulary	37.72%	100%

In our study, it was found that a total of 1967 medicines where prescribed during discharge. The average number of medicines per prescription was found to be 10.82 which was also larger than the WHO Core Standard values(<2), 7.78% of drugs were prescribed by generic names 31.31% of patients received antibiotics and 37.72% of drugs belonged to National list of essential medicines.

4. Conclusion
Out of 200 COPD patients who were admitted in Star Hospital, maximum patients were female patients and from the age group 70-79. The most frequent comorbidity observed were hypertension and cor pulmonale and maximum number of hospital stay was 4 days. The results obtained from this study showed that most commonly prescribed medicines were Doxophylline, Tiotropium bromide, Ipratropium bromide, Hydrocortisone, Prednisolone, Azithromycin, Ceftriaxone etc. The average number of medicines per prescription was found to be 10.82. 7.78% of drugs were prescribed by generic names, 31.31% of patients received antibiotics and 37.72% of prescribed drugs belonged to National list of essential medicines.

5. Acknowledgment

6. Conflict of Intrest
Authors have no any conflict of interest.

7. References
1. Ministry of Health and Population. Department of Health Services, C. S. D. Standard Treatment Protocol (Stp) for Basic Health Services (Bhs) Package. 2021; 310.
2. Karki KB, *et al*. Factors associated with chronic obstructive pulmonary diseases in Nepal: Evidence from a nationally representative population-based study. Int. J. COPD16, 2021, 1109-1118.
3. Adhikari TB, Neupane D, Kallestrup P. Burden of COPD in Nepal. Int. J. COPD13, 2018, 583-589.
4. GOLD-REPORT-2022-v1.1-22Nov2021_WMV (1).pdf.
5. Sawant MP, Padwal SL, Kale AS, Pise HN. Shinde RM. Study of drug prescription pattern among COPD patients admitted to medicine in-patient department of tertiary care hospital. Int. J. Basic Clin. Pharmacol. 2017; 6:2228.
6. Kessler R, *et al*. Symptom variability in patients with severe COPD: A pan-European crosssectional study. Eur. Respir. J. 2011; 37:264-272.
7. Westbroek LF, *et al*. Reducing the number of hospitalization days for copd: Setting up a transmural-care pathway. Int. J. COPD15, 2020, 2367-2377.
8. Gigi A, Sunil S, Hepzhiba P, Mahesh NM. ABS001. 103.
9. Cazzola M, Calzetta L, Rogliani P, Page C, Matera MG. Impact of doxofylline in COPD: A pairwise meta-

analysis. Pulm. Pharmacol. Ther. 2018; 51:1-9.

10. Maqusood M, Khan FA, Kumar M. A Study of Prescription Pattern in the Management of COPD in a Tertiary Care Hospital. Ann. Int. Med. Dent. Res, 2016. Doi: doi:10.21276/aimdr.2016.2.3.39

11. Chen AM, Bollmeier SG, Finnegan PM. Long-acting bronchodilator therapy for the treatment of chronic obstructive pulmonary disease. Ann. Pharmacother. 2008; 42:1832-1842.

12. Cazzola M, *et al*. Influence of N-acetylcysteine on chronic bronchitis or COPD exacerbations: A meta-analysis. Eur. Respir. Rev. 2015; 24:451-461.

13. Leiva-Fernandez J, *et al*. Study protocol for a randomized, controlled trial comparing the efficacy of two educational interventions to improve inhalation techniques in patients with chronic obstructive pulmonary disease (COPD): TIEPOC Study. Drugs Context. 2014; 3:1-7.

14. Mehaneesha K, *et al*. A retrospective study on drug utilisation pattern in management of rheumatoid arthritis. Res. J. Pharm. Technol. 2020; 13:5263-5266.

15. Dwivedi M, *et al*. Study of Drug Prescribing Practises in Tertiary Care Teaching Hospitals for Patients with COPD. 2022; 13:2354-2360.

16. Ernst P, *et al*. Comparative effectiveness of fluoroquinolone antibiotic use in uncomplicated acute exacerbations of COPD: A multi-cohort study. Int. J. COPD14, 2019, 2939-2946.

17. Phillips H, Van Hook CJ, Butler T, Todd WM. A comparison of cefpodoxime proxetil and cefaclor in the treatment of acute exacerbation of COPD in adults. Chest. 1993; 104:1387-1392.

18. Huckle AW, Fairclough LC, Ma IT. Prophylactic Antibiotic Use in COPD and the Potential Anti-Inflammatory Activities of Antibiotics. 2018; 0:1-11.

19. Kato H, *et al*. Meta-analysis of vancomycin versus linezolid in pneumonia with proven methicillin-resistant Staphylococcus aureus. J. Glob. Antimicrob. Resist. 2021; 24:98-105.