



Tropical Journal of Pharmaceutical and Life Sciences

(An International Peer Reviewed Journal)

Journal homepage: <http://informativejournals.com/journal/index.php/tjpls>



Evaluation of Fixed Dose Combinations in Orthopaedic Patients in Outpatient Department

Syeda Zuleqa Unnisa Begum B^{1*}, Bushra Noorie², Kareema Begum³, Ayesha Tahooa⁴, Afreen Muneeb⁵

¹PhD in Pharmacy, Associate Professor, Deccan School of Pharmacy, Darussalam, Hyderabad, India.

^{2,3,4,5} B Pharmacy Students, Deccan School of Pharmacy, Darussalam, Hyderabad, India.

ARTICLE INFO:

Received: 17th May 2026; **Received in revised form:** 29th May 2026; **Accepted:** 28th June 2026; **Available online:** 30th June 2026.

Abstract

Background: Fixed Dose Combinations (FDCs) are commonly used in orthopaedic practice to treat conditions such as pain, inflammation, muscle spasms, and other musculoskeletal problems. When used appropriately, these combinations can make treatment more convenient by reducing the number of tablets a patient needs to take and may help improve treatment outcomes.

Aim: To study the prescribing pattern and use of Fixed Dose Combinations (FDCs) in orthopaedic patients attending the outpatient department and to understand their role in treatment as well as the current prescribing trends.

Methodology: An observational study was conducted in the Orthopaedic Outpatient Department of Princess Esra Hospital and Research Centre. The study included patients aged between 18 and 70 years who were prescribed fixed dose combinations. Information was collected from nearly 300 prescriptions over a one-month period using a structured data collection form.

Results: Among the study population, females accounted for 61.2% of patients, while males represented 38.8%. The age group 49–58 years showed the highest prevalence. Pain was the most common presenting symptom (178 patients). NSAIDs and analgesics were the most prescribed drug class (293 prescriptions), followed by supplements (288 prescriptions).

Conclusion: Fixed Dose Combinations are commonly prescribed in orthopaedic practice for the treatment of pain, inflammation, muscle spasms, and nutritional deficiencies. Their proper use can help in better patient care and treatment outcomes. Regular monitoring of prescriptions can also support the safe and effective use of these medicines.

Keywords: Fixed dose Combinations, Orthopaedics, Drug utilization, Prescription pattern, NSAIDs, Rational drug use.

Introduction

Musculoskeletal disorders are one of the major health problems that can affect a person's daily activities and quality of life.^[1] Conditions such as fractures, osteoarthritis, rheumatoid arthritis, lumbar spondylosis,

*Corresponding Author:

Syeda Zuleqa Unnisa Begum B

DOI: <https://doi.org/10.61280/tjpls.v13i3.302>

© 2026 The Authors. Tropical Journal of Pharmaceutical and Life Sciences (TJPLS Journal)

Published by **Informative Journals** (Jadoun Science Publishing Group India)

This article is an open access article distributed under the terms and conditions of the
Creative Commons Attribution-Non Commercial 4.0 International License.

dislocations, and soft tissue injuries often require medication for symptom relief and recovery. Patients visiting orthopaedic departments commonly experience pain, inflammation, muscle spasms, limited movement and other related problems, which may require more than one medicine for treatment.^[2,19]

Fixed Dose Combinations (FDCs) are medicines that contain two or more active ingredients combined in a single dosage form. These combinations are widely used because they make treatment simpler, reduce the number of tablets a patient has to take, and may improve patient compliance. In some cases, they can also provide better therapeutic benefits.^[20]

In orthopaedic practice, FDCs are commonly prescribed in the form of pain relievers, anti-inflammatory drugs, muscle relaxants, vitamins, minerals, and medicines used for nerve-related pain. While these combinations have several advantages, their inappropriate use may increase the risk of side effects and add to treatment costs^[3,4]. Drug utilization studies help in understanding how medicines are being prescribed and used in clinical practice^[5]. Studying the prescribing pattern of FDCs can help identify whether these medicines are being used appropriately and can contribute to better patient care and treatment outcomes.^[21,22]

Aim and Objectives

Aim

To evaluate the prescribing pattern and utilization of Fixed Dose Combinations in orthopaedic patients attending the outpatient department.

Objectives

- To collect and analyze prescriptions containing FDCs.
- To identify commonly prescribed FDCs.
- To classify FDCs according to therapeutic categories.
- To evaluate utilization patterns in orthopaedic patients.
- To assess prescribing trends and rationality of FDC use.

Methodology

Study Design

Prospective and observational study

Study Population

The study was conducted on 250 patients between 18 and 70 years of age who attended the Orthopaedic OPD at Princess Esra Hospital. These patients were prescribed fixed-dose combination medications, including NSAIDs with paracetamol or muscle relaxants and were enrolled in the study based on the specified inclusion and exclusion criteria.

Sample Size

A sample size of around 300 patients was selected over a period of one month.

Data Collection

Data collection was done using a structured data collection form. Information such as patient demographics, diagnosis, prescribed drugs, dose, frequency and duration of treatment was recorded carefully.

Inclusion Criteria

- Patients were included in the study if they fulfilled the following criteria:
- Age between 18 and 70 years, irrespective of gender.
- Attending the Orthopaedic Outpatient Department (OPD) during the study period.
- Diagnosed with common orthopaedic conditions such as low back pain, knee pain, fractures, gouty arthritis, lumbar spondylitis and other musculoskeletal disorders.
- Prescribed at least one fixed-dose combination (FDC) as part of their treatment regimen.
- Both pre-operative and post-operative orthopaedic patients were considered eligible.

- Willing to participate in the study and provide informed consent for the use of prescription data, where applicable.

Exclusion Criteria

- Patients were excluded from the study based on the following criteria:
- Individuals younger than 18 years or older than 70 years.
- Patients from departments other than orthopedics or those with non-musculoskeletal conditions.
- Patients who were not prescribed any fixed dose combinations (FDCs).
- Prescriptions with incomplete, unclear, or missing information affecting data reliability.
- Pregnant and lactating women due to variations in prescribing practices and safety considerations.
- Patients with severe systemic diseases (e.g. advanced cardiac, renal and hepatic disorders) that could influence prescribing patterns.
- Individuals unwilling to participate or whose data could not be used due to ethical constraints.

Data Collection

Data regarding demographics, diagnosis, symptoms, prescribed drugs, dosage, frequency and duration of therapy were collected using a structured data collection form.

Statistical Analysis

Data were analyzed using Microsoft Excel and expressed as frequencies and percentages.

Plan of Work

Selection of Title

The study topic was chosen to evaluate the prescribing pattern, effectiveness and safety of fixed-dose combinations used in orthopaedic conditions.

Literature Review

A detailed review of published articles, textbooks and clinical guidelines related to orthopaedic FDCs (such as NSAIDs combinations and muscle relaxants) was carried out to understand current practices and research gaps.

Designing Data Collection Form

A structured data collection form was prepared to record all relevant patient details, including demographics, diagnosis, prescribed drugs, dosage and duration of therapy.

Collection of Patients Data (Demographic)

Patient information such as age, gender, medical history, diagnosis, and treatment details was collected from case sheets, prescriptions and patient interviews.

Patients' information was collected based on their condition such as osteoarthritis, rheumatoid arthritis, low back pain, fractures, or post-operative pain.

Diagnosis

The patients included in the study were diagnosed with various orthopaedic and musculoskeletal disorders such as fracture, gout arthritis, lumbar spondylosis, knee gap and rickets. These conditions were associated with symptoms including pain, inflammation, restricted movement, swelling and joint discomfort. Based on the clinical condition and diagnosis, suitable treatment regimens were prescribed to improve patient outcomes and reduce complications.

Treatment

The treatment pattern observed in the study mainly consisted of two categories, namely fixed dose combinations and single-dose therapy. The medications were prescribed according to the severity of the disease condition, associated symptoms and patient requirements.

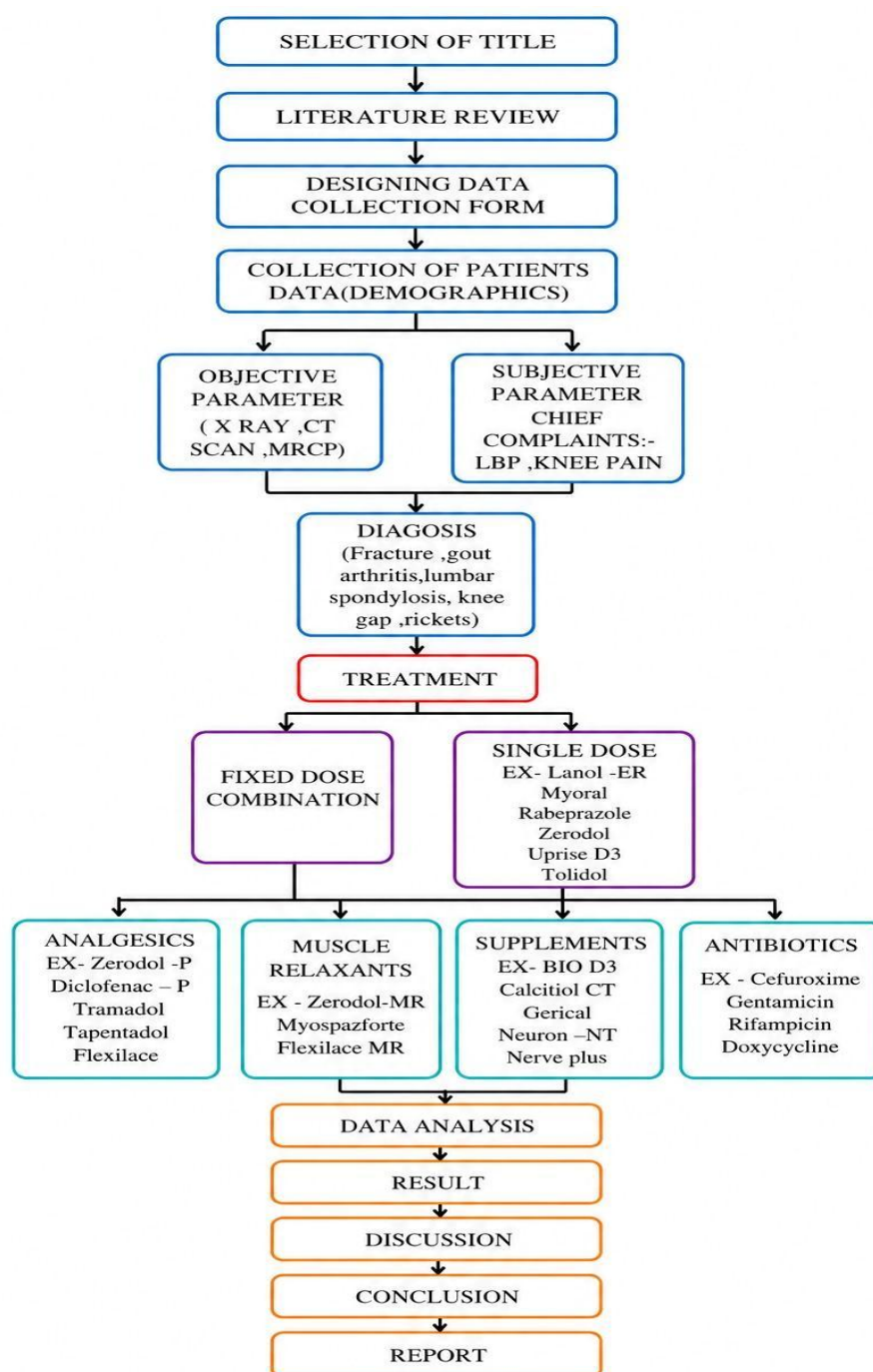
Single Dose

Single-dose medications were also prescribed depending on the patient's condition and therapeutic requirement. Commonly prescribed single-dose drugs included Lanol-ER(Acetaminophen 650mg), Myoril (Thiocholchicoside 4- 8 mg) , Rabeprazole (Ant acid 10-20 mg) Zerodol (Aceclophenac 100 mg), up rise D3 (cholecalciferol + 60,000 IU) pantaprazole (PPI 40 mg) Febuxostat (xanthine oxidase inhibitors 40 mg) and Etoricoxib (selective cox 2 inhibitors 30mg,60mg,90mg,120mg).These medications were mainly used for pain management, gastric protection, muscle relaxation and vitamin supplementation.

Data Analysis

Collected data were organized and analyzed using appropriate statistical methods to compare the outcomes of different FDCs.

The data were analysed by using Microsoft Excel with descriptive statistics and percentage analysis and will be presented Using graphs, pie charts and tables. This ensured that the study reflected real-world prescribing patterns.



Plan of Work

Results

Age Wise Distribution

The age-wise distribution of patients showed that most patients were in the 49–58 years age group, followed by those in the 39–48 years age group. The number of patients gradually decreased in the higher age groups with the least number of patients belonging to the 69–78 years age group.

Table 1. Age-wise Distribution

Age interval	No.of patients
19-28	49
29-38	40
39-48	56
49-58	61
59-68	32
69-78	12

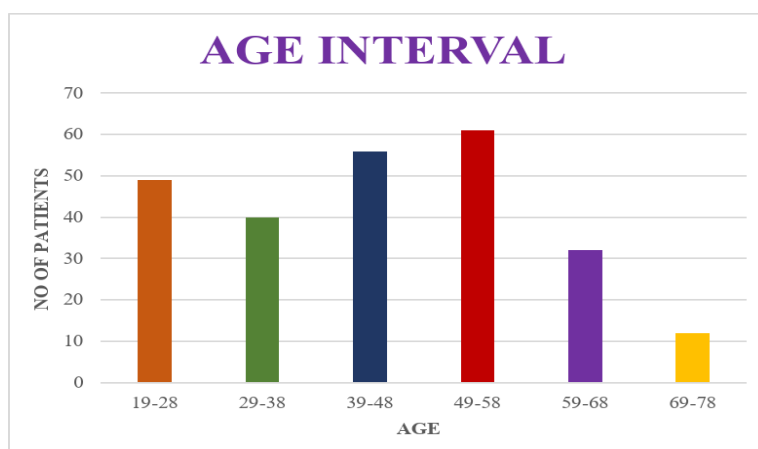


Figure 1: Age-wise Distribution of Patients

Gender Wise Distribution

Among the 250 patients included in the study, females constituted the majority of the study population, whereas males represented a smaller proportion.

Table 2: Gender Distribution

Gender	No. of patients
Male	97
Female	153

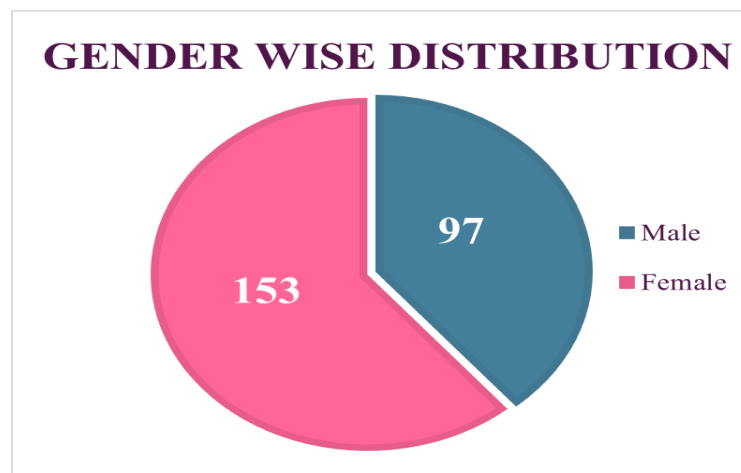


Figure 2: Gender-wise Distribution of Patients

Symptoms

Pain was the most commonly reported symptom among patients, accounting for the majority of cases. Swelling was the second most frequent complaint, while fractures, multiple joint disorders, and dislocations were reported less frequently.

Table 3: Symptoms Distribution

Symptoms	No. of patients
Pain	178
Fracture	16
Swelling	30
Multiple joint disorders	14
Dislocation	12

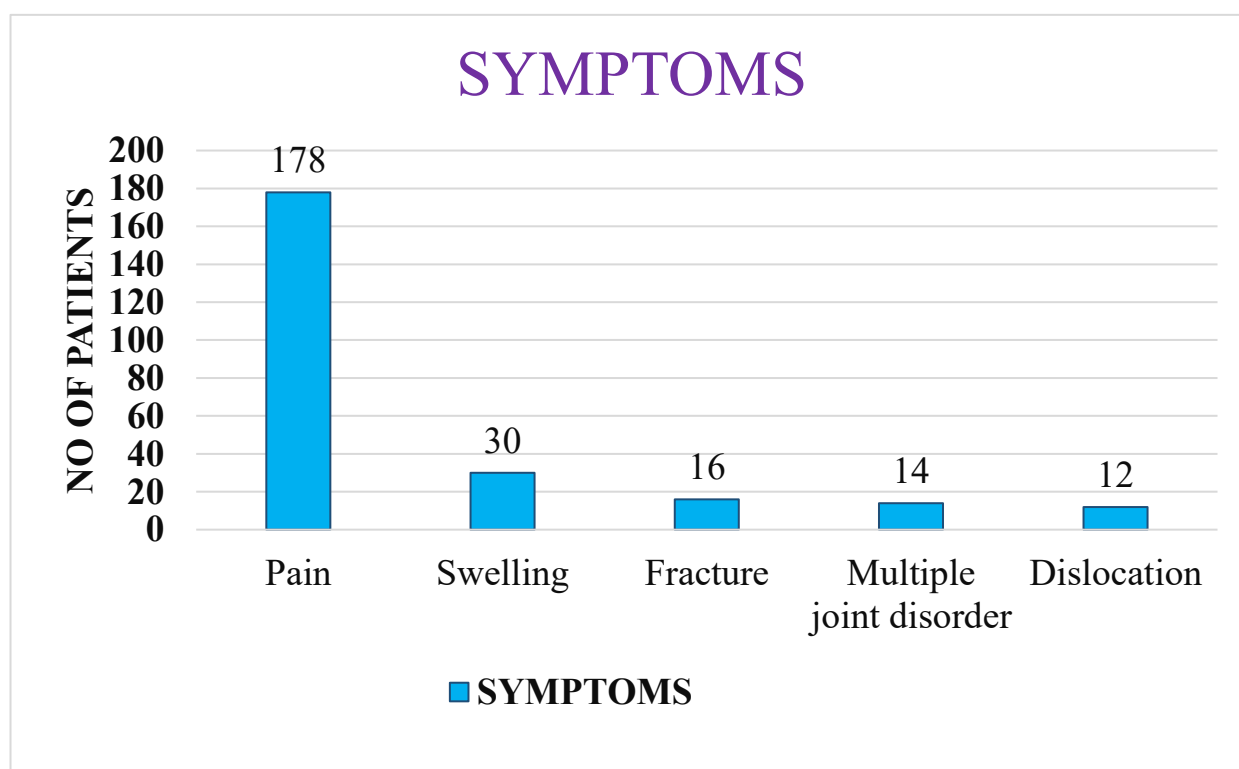


Figure 3: Distribution of Patients According to Symptoms

Past History

Diabetes mellitus with hypertension was the most commonly observed comorbidity, followed by hypertension alone. Other conditions such as hypothyroidism, chronic kidney disease and coronary artery disease were less frequently reported.

Table 4. Past History

Condition Combination	Count
DM + HTN	49
HTN	35
CAD, CKD, PTLA	8
CKD + DM	5
Seizures	3
Trauma cases	2
Hypothyroidism	8

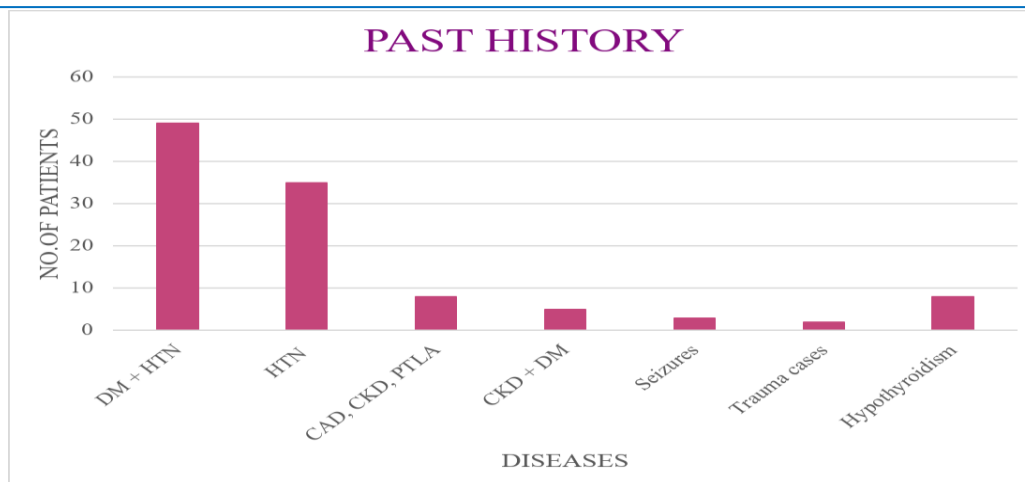


Figure 4: Distribution of Patients According to Past Medical History

Diagnosis

Pain and swelling constituted the most common diagnosis among patients, followed by fractures and other musculoskeletal conditions. Dislocations, abrasions, injuries, and lumbar spondylosis were observed in comparatively fewer cases. Overall, musculoskeletal and trauma-related disorders accounted for the majority of diagnoses.

Table 5: Diagnosis distribution

Diagnosis	Number of Patients
Pain & Swelling	70
Fracture	33
Dislocation	25
Abrasion	21
Injury	15
Lumbar Spondylosis	10
Plantar Fasciitis	7
Others	30

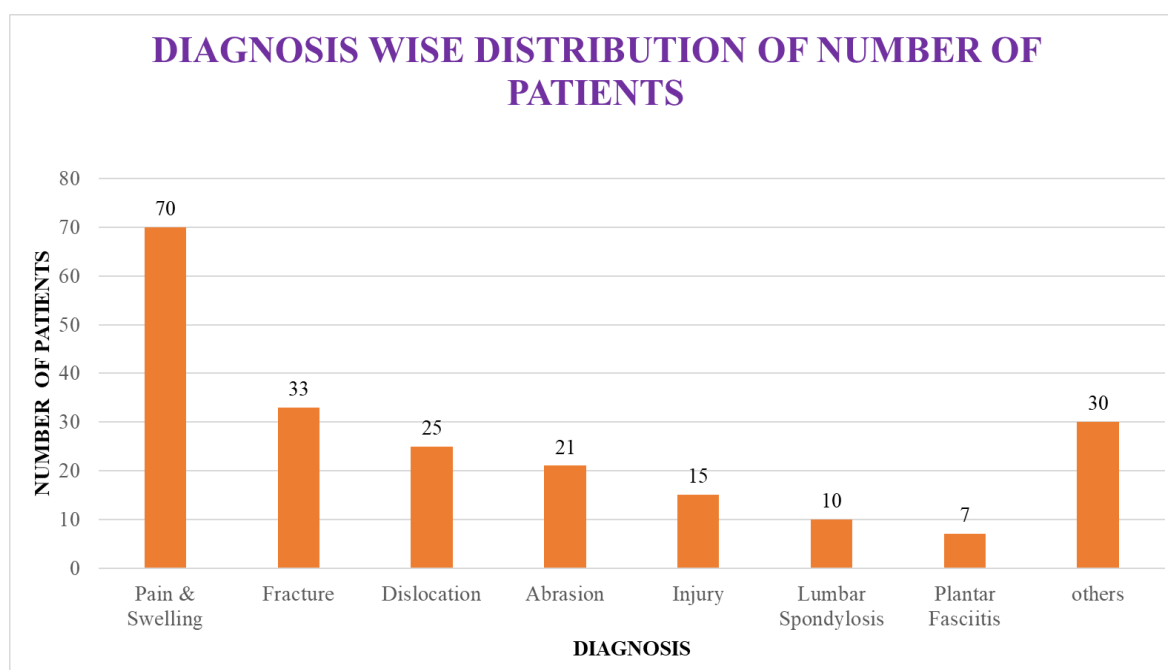


Figure 5: Diagnosis-wise Distribution of Patients

Classes Of Drugs

NSAIDs/analgesics were the most commonly prescribed class of drugs, closely followed by nutritional supplements. Proton pump inhibitors and antiepileptic drugs were also frequently prescribed, whereas antibiotics, muscle relaxants, immunosuppressants and antihistamines were used less often. The prescribing pattern reflects the management of pain, inflammation, and associated conditions.

Table 6. Drug Classes Prescribed

Classes of Drugs	No. Of patients
Antihistamines	7
Anti-rheumatoid	15
Immunosuppressant	29
Muscle relaxants	43
Antibiotics	55
Seizures	88
Proton pump inhibitors	139
Supplements	288
NSAIDS/Analgesics	293

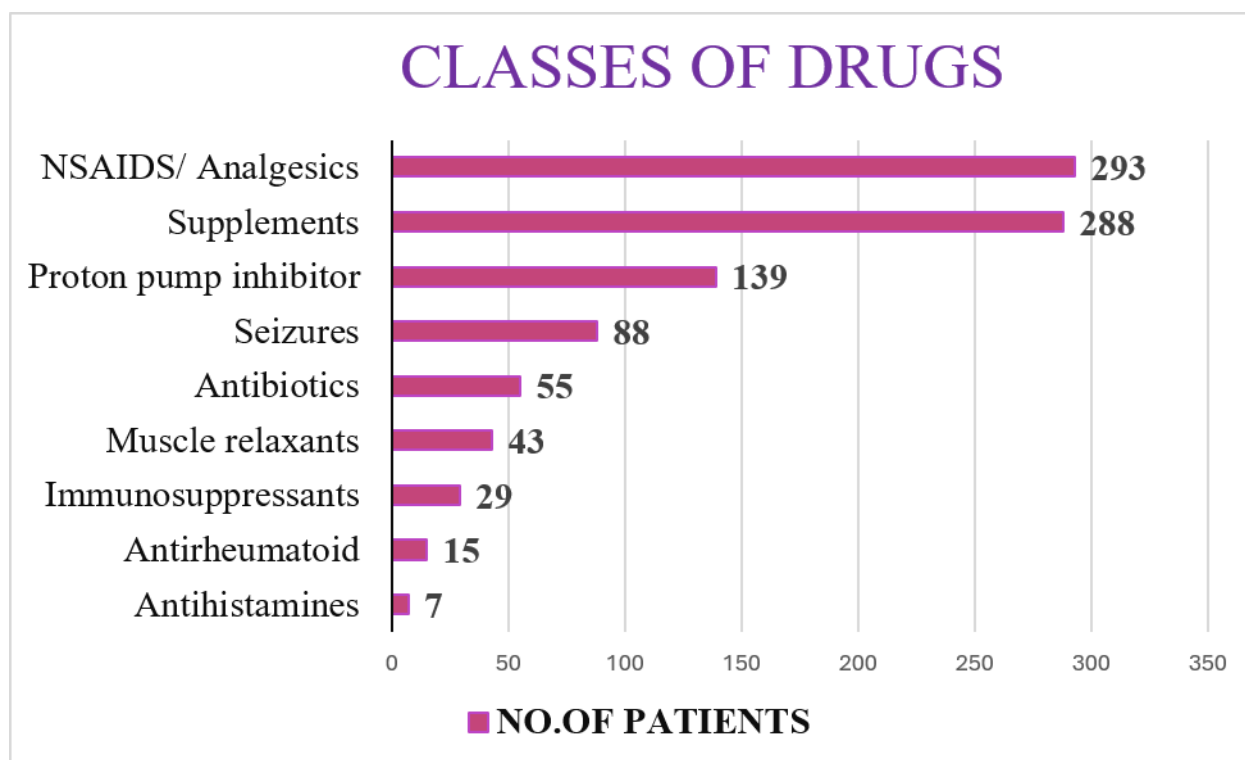


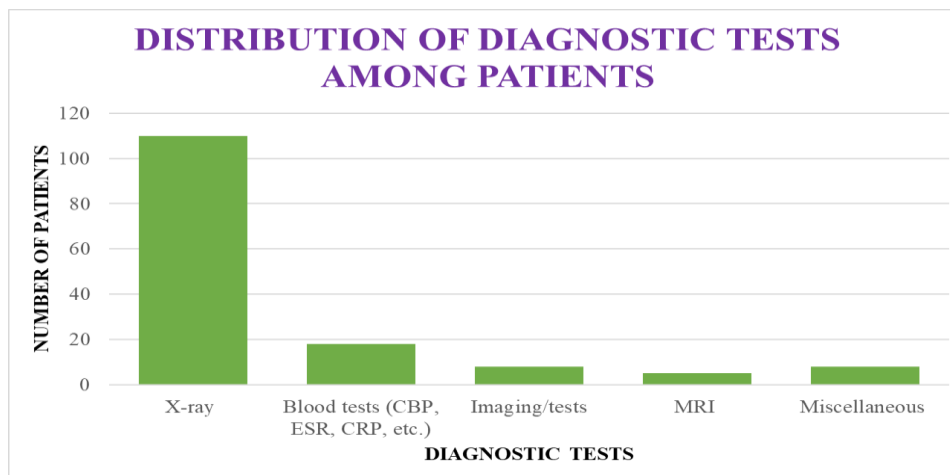
Figure 6: Distribution of Drug Classes Prescribed

Diagnosis Test

X-ray was the most frequently utilized diagnostic investigation and represented the primary imaging modality for patient evaluation. Blood tests were used in a smaller proportion of cases, while MRI and other investigations were performed less frequently. This reflects the important role of X-ray in diagnosing musculoskeletal conditions.

Table 7: Diagnosis Test

Test	Count
X-ray	110
Blood tests (CBP, ESR, CRP, etc.)	18
Imaging/tests	8
MRI	5
Miscellaneous / unclear	8

**Figure 7: Distribution of Diagnostic Tests**

Single Dose of Drugs

Rabeprazole was the most frequently prescribed individual drug, followed by gabapentin and Tofacitinib. Other commonly prescribed medications included vitamin supplements, anti-inflammatory agents, and gastrointestinal protectants.

Table 8: Single Dose of Drugs

Single Drugs	No. of patients
Rabeprazole	119
Gabapentin	101
Tofacitinib	98
Vitamin C	91
Febuxostat	90
Etoricoxib	90
Pantoprazole	89
Mycophenolate	88
Hydroxychloroquine	85
Aceclofenac	82
Cefixime	85
Cholecalciferol	82
Linezolid	78
Etodolac	78
Enzomac	78
Betahistidine Dihyochloride	78
Flupirtine	77
Clindamycin	75
Thiocolchicoside	67
Ciprofloxacin	66
Flavoxate	62
Indomethacin	61
Deflazocort	60
Cefuroxime	58
Paracetamol	57
Atorvastatin	56

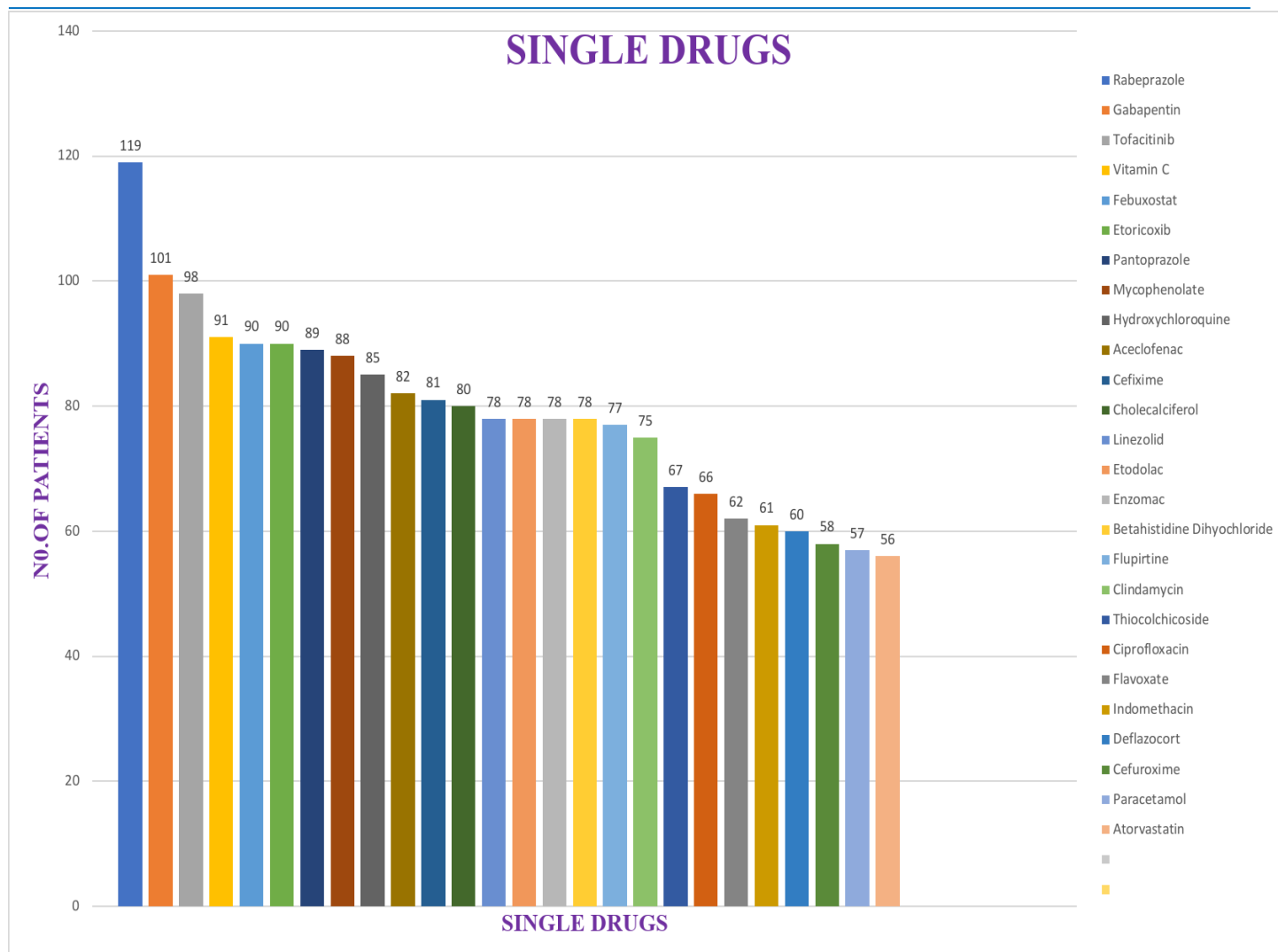


Figure 8: Distribution of Single Drug Prescriptions

Fixed Dose Combination of Drugs

Calcium carbonate, vitamin D3, zinc, and magnesium combination was the most frequently prescribed fixed-dose combination. Analgesic and muscle relaxant combinations such as etoricoxib with thiocolchicoside and aceclofenac-based combinations were also widely used.

Table 9: Common Fixed Dose Combinations

Fixed dose combinations drugs	No. of patients
Calcium carbonate +Vitamin D3 +Zinc Magnesium	314
Etoricoxib+Thiocolchicoside	233
Aceclofenac +Paracetamol+Serrtiopeptidase	192
Rabeprazole+ Domperidone	178
Trypsin+Chymotrypsin	172
Amoxicillin+Clavulanic acid	162
Aceclofenac +Tizanidine	151
Artesunate+Sulfadoxine+Pyrimethamine	149
Tramadol+Paracetamol	143
Aceclofenac +Thiocolchicoside	142
Gabapentin+Nortriptyline	132
Gabepentin + Methylcobalamin	131
Nimesulide+ Paracetamol	128
Pregabalin+Nortriptyline+Mathylcobalamine	121
Aceclofenac +Paracetamol	112
Paracetamol +Phenylephrine+Chlorphenairamine	111

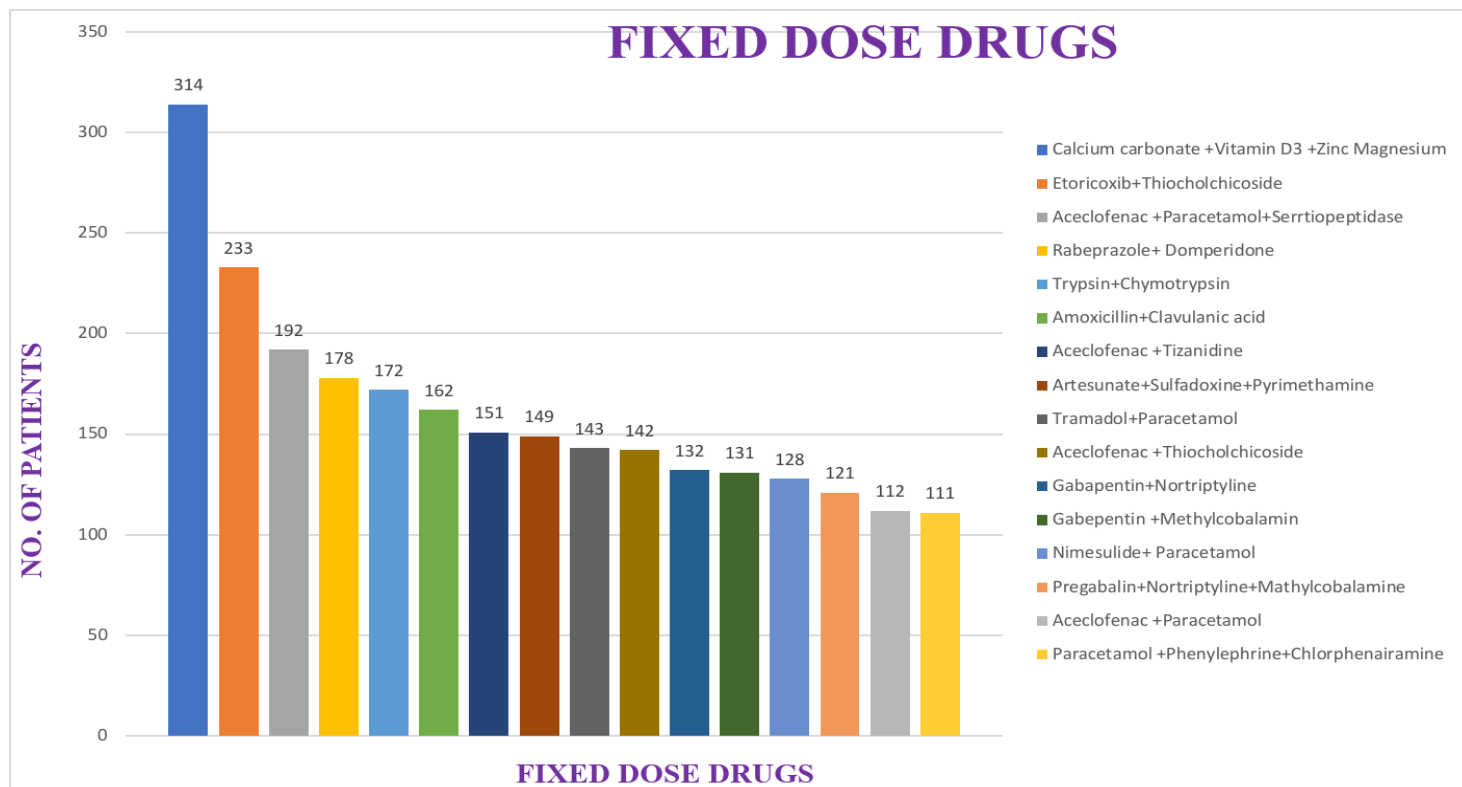


Figure 9: Distribution of Fixed-Dose Combination Drugs

Discussion

The present study evaluated the prescribing pattern and utilization of Fixed Dose Combinations (FDCs) among orthopaedic outpatients attending a tertiary care teaching hospital. Drug utilization studies are important tools for assessing prescribing practices and promoting rational drug use in clinical settings. The findings of the present study were compared with previously published literature to assess similarities and variations in prescribing trends. In the present study female patients constituted 61.2% of the study population, whereas males accounted for 38.8%. A similar female predominance in musculoskeletal disorders has been reported by Woolf and Pfleger.^[6] The majority of patients belonged to the age group of 49 to 58 years. Similar observations have been reported in orthopaedic drug utilization studies where middle-aged and elderly individuals represented the largest patient population because of age-related degenerative changes and increased incidence of joint disorders and fractures.^[7,11] Pain was the most commonly reported symptom, accounting for 178 cases, followed by swelling and fractures. These findings are consistent with the study conducted by Deshpande et al.^[7] The most frequently observed comorbidity in the present study was diabetes mellitus associated with hypertension. Similar findings have been reported in hospital-based studies where metabolic and cardiovascular disorders frequently coexist with orthopaedic conditions. NSAIDs and analgesics were the most commonly prescribed drug class, accounting for 293 prescriptions. This observation is in agreement with earlier studies that identified NSAIDs as the cornerstone of pharmacological management in orthopaedic patients.^[7,8]

Nutritional supplements represented the second most frequently prescribed drug category. Calcium, vitamin D3, zinc, and magnesium preparations were prescribed extensively. Similar prescribing trends have been reported by Rani et al.^[10] Proton pump inhibitors were also prescribed frequently and were commonly co-prescribed with NSAIDs to reduce gastrointestinal adverse effects.^[14] Among individual drugs, rabeprazole, gabapentin, and tofacitinib were frequently prescribed. Similar utilization patterns have been documented in patients with chronic musculoskeletal pain and inflammatory arthritis.^[15,16] The most commonly prescribed FDC was Calcium Carbonate + Vitamin D3 + Zinc + Magnesium. Similar supplementation-based combinations have been reported in orthopaedic prescribing studies because of their beneficial effects on bone metabolism and fracture recovery.^[10]

Analgesic and muscle relaxant combinations such as Etoricoxib + Thiocolchicoside and Aceclofenac-based combinations were also commonly prescribed. Previous studies have demonstrated that combinations of NSAIDs and muscle relaxants provide superior symptomatic relief compared with monotherapy.^[17,18]

The prescription of Tramadol + Paracetamol, Gabapentin + Nortriptyline, and Pregabalin-based combinations indicates the adoption of multimodal pain management strategies.^[10] Overall, the prescribing pattern observed in the present study was largely consistent with findings reported in national and international orthopaedic drug utilization studies. Nevertheless, periodic prescription audits and continuous evaluation of FDC rationality remain essential to ensure evidence-based prescribing and optimize therapeutic outcomes.^[21-23]

Conclusion

The present study was conducted to evaluate the prescribing pattern and utilization of fixed dose combinations (FDCs) in the Orthopaedic Department. The findings of the study revealed that FDCs are widely prescribed in Orthopaedic practice for the management of pain, inflammation, fractures, musculoskeletal disorders, and post-operative conditions. The study demonstrated that middle-aged adults, particularly females, constituted the majority of the study population. Pain and swelling were identified as the most common presenting complaints among patients. Among the prescribed medications, NSAIDs/analgesics and nutritional supplements formed the major proportion of drug utilization, indicating the importance of pain management and supportive therapy in Orthopaedic care. Proton pump inhibitors were also frequently prescribed along with analgesics to minimize gastrointestinal adverse effects associated with long-term NSAID therapy. Commonly used FDCs included combinations of NSAIDs with muscle relaxants, analgesics with enzymes, and calcium with vitamin D₃ supplements.

The study also highlighted that the use of FDCs helps in reducing pill burden, improving patient compliance, and enhancing therapeutic effectiveness. However, the findings emphasize the need for continuous monitoring of prescribing practices to ensure the rationality and safety of FDC use. Irrational combinations and unnecessary polypharmacy may increase the risk of adverse drug reactions and healthcare costs. Therefore, careful evaluation based on standard treatment guidelines and clinical necessity remains essential.

Overall, the study provides valuable insight into real-world prescribing trends in Orthopaedic patients and underscores the importance of rational drug utilization, pharmacovigilance, and evidence-based prescribing practices. The results of this study may help healthcare professionals, especially pharmacists and clinicians, to promote safer, more effective and patient-centered use of fixed dose combinations in Orthopaedic practice.

Acknowledgment

I want to sincerely thank all of the faculty members and my guide for their valuable advice and assistance during the writing of this research article. I am particularly grateful to Syeda Zuleqa unnisa Begum for her unwavering inspiration, encouragement and support throughout this work. I also want to express my sincere gratitude to my family and friends for their unwavering encouragement and support.

References

1. World Health Organization. Musculoskeletal health. Geneva: World Health Organization; 2022.
2. Jameson JL, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J. Harrison's Principles of Internal Medicine. 21st ed. New York: McGraw-Hill Education; 2022.
3. Gupta YK, Ramachandran SS. Fixed dose drug combinations: Issues and challenges in India. *Indian J Pharmacol.* 2016;48(4):347-349.
4. Gautam CS, Saha L. Fixed dose drug combinations (FDCs): Rational or irrational. *Br J Clin Pharmacol.* 2008;65(5):795-796.
5. World Health Organization. Introduction to Drug Utilization Research. Oslo: WHO Collaborating Centre for Drug Statistics Methodology; 2003.
6. Woolf AD, Pfleger B. Burden of major musculoskeletal conditions. *Bull World Health Organ.* 2003;81(9):646-656.

7. Deshpande SG, Tiwari P, Varma M. Drug utilization pattern in orthopaedic outpatient department of a tertiary care teaching hospital. *Int J Basic Clin Pharmacol.* 2018;7(3):513-518.
8. Brunton LL, Hilal-Dandan R, Knollmann BC. Goodman & Gilman's The Pharmacological Basis of Therapeutics. 14th ed. New York: McGraw-Hill Education; 2023.
9. Holick MF. Vitamin D deficiency. *N Engl J Med.* 2007;357(3):266-281.
10. Rani FA, Byrne PJ, Murray BF. Prescribing patterns of calcium and vitamin D supplementation in orthopaedic patients: A review. *J Orthop Surg Res.* 2019;14(1):221.
11. Tripathi KD. Essentials of Medical Pharmacology. 8th ed. New Delhi: Jaypee Brothers Medical Publishers; 2019.
12. Katzung BG. Basic and Clinical Pharmacology. 15th ed. New York: McGraw-Hill Education; 2021.
13. World Health Organization. Guidelines for Registration of Fixed-Dose Combination Medicinal Products. Geneva: World Health Organization; 2002.
14. Central Drugs Standard Control Organization. Guidelines for Approval of Fixed Dose Combinations in India. New Delhi: CDSCO; [cited 2026 May 19].
15. Shankar PR, et al. Irrational use of fixed dose combinations: need for intervention. *Indian J Pharmacol.* 2016.
16. Ofori-Asenso R, Agyeman AA. Irrational use of medicines: a summary of key concepts. *Pharmacy.* 2016;4:35.
17. Yilma Z, Liben M. Assessment of drug prescription pattern in Mekelle General Hospital, Mekelle, Ethiopia, using World Health Organization prescribing indicators. *BioMed Res Int.* 2020;2020:[3809157](https://doi.org/10.1186/s13047-020-0157-7).
18. World Health Organization. Guide to Good Prescribing. Geneva: World Health Organization; 2021 [cited 2026 May 19]. Available from: apps.who.int
19. Masoud A, Noori Hekmat S, Dehnavieh R, Haj-Akbari N, Poursheikhali A, Abdi Z. An investigation of prescription indicators and trends among general practitioners and specialists from 2005 to 2015 in Kerman, Iran. *Int J Health Policy Manag.* 2018;7:818-27.
20. Jain S, Upadhyaya P, Goyal J, Kumar A, Jain P, Seth V, et al. A systematic review of prescription pattern monitoring studies and their effectiveness in promoting rational use of medicines. *Perspect Clin Res.* 2015;6:86-90.
21. Chukka S, Syeda ZB, Mohd A. Assessment of pain intensity using summed pain intensity difference (SPID) in orthopedic operative patients. *Afr Health Sci.* 2025;25(3):173-183. doi:10.4314/ahs.v25i3.22.
22. Begum SZ, Chukka S, Akram M. Evaluating pain relief using total pain relief (TOTPAR) in operative orthopedic patients. *J Neonatal Surg.* 2025;14(32s):2693-2704.
23. Begum SZ, Chukka S, Akram M. Association between Socrates pain dimensions and sleep quality in orthopedic operative patients: an observational study. *Int J Environ Sci.* 2025;11(21s):3132-3138.

How to cite this article: Syeda zuleqa Unnisa Begum B, Bushra Noorie, Kareema Begum, Ayesha Tahooa, and Afreen Muneeb. "Evaluation Of Fixed Dose Combinations In Orthopaedic Patients In Outpatient Department". *Tropical Journal of Pharmaceutical and Life Sciences*, vol. 13, no. 3, June 2026, pp. 01-13, doi:10.61280/tjpls.v13i3.302.

Published by:
Informative Journals
Jadoun Science Publishing Group India

