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## DRUG UTILIZATION PATTERN OF ANALGESICS IN A TERTIARY CARE TEACHING HOSPITAL

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Received 25<sup>th</sup> Feb. 2025; Revised 24<sup>th</sup> April 2025; Accepted 9<sup>th</sup> July 2025; Available online 1<sup>st</sup> May 2026

<https://doi.org/10.31032/IJBPAS/2026/15.5.10121>

### ABSTRACT

**Background:** Analgesics also known as painkillers are the medications that relieve pain without losing consciousness, Drug utilization evaluation [DUE] study gazes at how people use, prescribe, market and distribute pharmaceuticals. Analgesics are often over prescribed on misuse leading to unnecessary side effects, complications. The present study has been to get overview of the current trends of analgesics utilization in health care center and facilities drug use based on guidelines in population.

**Aim and Objectives:** To study and Evaluate the Drug Utilization patterns of Analgesics in the various department of a tertiary care teaching Hospital, Khammam.

**Methodology:** The study which is performed, observation and prospective in nature in order to evaluate [or] study the drug utilization pattern of analgesics. The drugs, dose, frequency of drugs and assessing the severity of the pain and type of pain by standard MC Gill pain questionnaire and Numerical pain rating scale from the patient record who prescribed with analgesics along with patient demographics.

**Results:** As per our study, total of 391 analgesics are used among the 200 patients. And out of 200 subjects more number of subjects taking analgesics are male 61% and female 39%. The most frequently used analgesics is paracetamol 44.75%, followed by tramadol 29.66%, diclofenac 18.92%, aceclophenac 3.83%, naproxen 1.53% and aspirin, ketorolac, etoricoxib, indomethacin used 0.25%.

**Conclusion:** The study of DUE of analgesics gives financial gains and early identification of drug related issues such as drug interactions, adverse reactions and repeated drug usage. prescription errors in india are mostly caused by the lack of opportunities for clinical pharmacist to participate in prescription supervision. one possible function in there in health care system is to help doctors change the number of the medications that patients take, improve medication adherence, provide patient counselling, improve patient health and lower patient health care cost.

**Keywords:** Drug utilization pattern, Analgesics, Mc gill pain questionnaire, Numerical pain rating scale

## 1. INTRODUCTION:

Analgesic medication use patterns are the systematic and observation of how analgesic Pain is an unpleasant sensory and emotional experience linked to or defined in terms of tissue damage. An analgesic also known as painkiller is a drug used to relieve pain without causing loss of consciousness. It works by blocking pain signals or altering the brain's perception of pain [1-3].

Analgesics are widely used for their pain relieve property also used in arthritis, headaches, post-surgical pains and severe and cancer pains. However, they are also associated with some serious side effects such as gastroduodenal ulcer and bleeding, kidney damage or chronic kidney disease, atrial fibrillation and hyperalgesia. But due to their pain relieve and anti-inflammatory effects they are prescribed widely by physicians [4-6].

Given that many patients are administered analgesics for long term pain relieve treatment, there has been growing concern about the safety of this medications. NSAIDs can damage the gastroduodenal

mucosa leading to cause ulcer and bleeding. Long term use of painkillers can also lead to kidney damage or failure, atrial fibrillation and hyperalgesia [7-9].

A Drug Utilisation Evaluation (DUE) study gazes at how people use, prescribe, market and distribute pharmaceuticals in society, DUE can be used to describe drug use patterns, illogical drug use and the enhance the quality of drugs. The main goal is to facilitate the rational use of drugs in community [10-11]. The primary aim of a Drug Utilisation Evaluation is to support optimal medication use and ensure drug therapy aligns with current treatment standards. Other goals may include -:

- Guidelines creation for appropriate drug utilisation.
- Evaluation of the effectiveness of medication therapy.
- Enhancing responsibility in the medicine use process.
- Controlling medicine cost.

Along with the McGill questionnaire forms, numerical pain rating scale is used to indicate the pain intensity patients are experiencing [12-13].

Pain severity assessment includes-

- post-operative pain
- surgical pain
- generalized pain

The study of prescribing patterns aims to evaluate and direct medical professionals in order to make the health delivery system more economic and logical. The rational use of analgesics avoid misuse, complications of long term harms. The rational use of analgesics involves prescribing or using painkillers in a way that ensures maximum benefits, minimal harms and cost effectiveness [14-26].

#### **AIM & OBJECTIVES:**

##### **Aim:**

To study and Evaluate the Drug Utilization patterns of Analgesics in the various department of a tertiary care teaching Hospital, Khammam.

##### **Objective:**

- ✓ To evaluate the most common used analgesics in various conditions.
- ✓ To evaluate the dose and frequency of administration of analgesics used.
- ✓ To evaluate the important causes for prescribing analgesics.
- ✓ To evaluate the assessment of pain type and severity of pain based on preferred analgesics.

#### **METHODOLOGY:**

##### **Study Design:**

The study which is performed, observation and prospective in nature in order to evaluate (or) study the drug utilization pattern of analgesics.

Patients prescribed with analgesics either of NSAID's, opioids, non-opioids and other miscellaneous drugs in various departments, were randomly collected. The Drugs, dose, dosage, frequency of drugs and assessing the severity of the pain and type of pain by standard mc gill pain questionnaire and numerical pain rating scale from the patient record who prescribed with analgesics along with patient demographics.

##### **Ethical Consideration:**

The study protocol prepared and submitted to the IEC. The study protocol was approved by IEC.

##### **Study Site:**

The Study was performed in various departments of Mamatha General Hospital, Khammam.

##### **Study Criteria:**

##### **Inclusion Criteria:**

- ✓ In patients prescribed with analgesics
- ✓ Patients are either gender
- ✓ Patients above 18 years of age

##### **Exclusion Criteria:**

- ✓ Patients below 18 years of age
- ✓ Lactating and nursing mothers
- ✓ Pregnant women
- ✓ Patients treated on outpatient basis

**Source of Data:**

- ✓ In patient profile form
- ✓ Laboratory data record
- ✓ By conducting patient history interview

**Collection Of Data:**

The sample was collected using suitable designed data collection form.

**Sample size:**

- ✓ 200 patients

**Statistical analysis:**

The Statistical Analysis was carried out by Microsoft office [ Microsoft word, Microsoft excel and Graph pad prism]

**Duration of study:**

The study was performed for a period of 6 months after obtaining IEC clearance

**RESULTS AND DISCUSSION:**

All subjects satisfy the inclusion and exclusion criteria were included as the study population. Total 200 in patients' subjects

prescribed with analgesics were included in the study.

**Gender Categorization**

Subjects were categorized according to gender and out of 200 subjects 122 (61%) were male and 78 (39%) were females shown in **Table 1 and Figure 1.**

**AGE GROUP CATEGORIZATION**

Out of 200 subjects 40(20%) subjects were in age group of 18-30 years,50(25%) subjects were in age group of 31-40 years, 38(19%) subjects were in age group of 41-50 years, 32(16%) subjects were in group of 51-60 years, 40(20%) subjects were in age group above 60 years shown in **Table 2 and Figure 2.**

**RESIDENCE OF SUBJECTS**

Out of 200 subject 70 (35%) Were from Urban Area and 130 (65%) were from Rural area as shown in **Table 3 and Figure 3.**

Table 1: Gender distribution of the subjects

Gender	No. Of subjects	Percentage (%)
Male	122	61
Female	78	39
Total	200	100

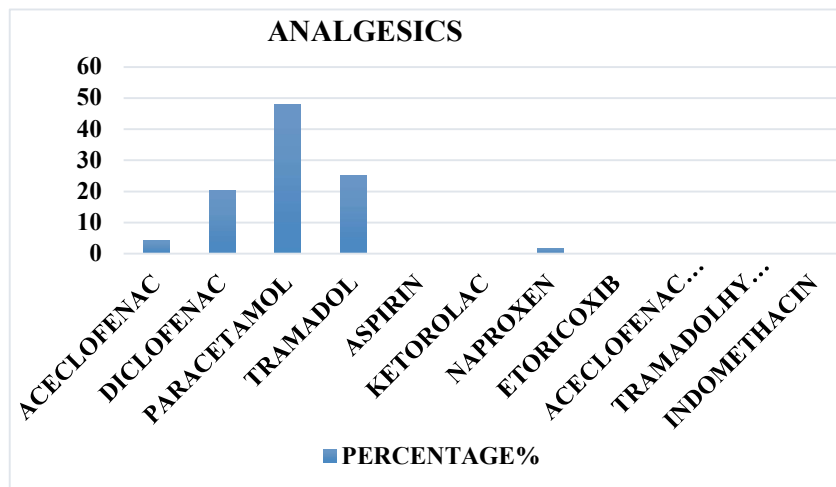


Figure 1: Gender distribution of the subjects

Table 2: Age Classification in different categories

Age	No. Of subjects	Percentage (%)
18-30	40	20
31-40	50	25
41-50	38	19
51-60	32	16
>60	40	20
<b>Total</b>	<b>200</b>	<b>100</b>

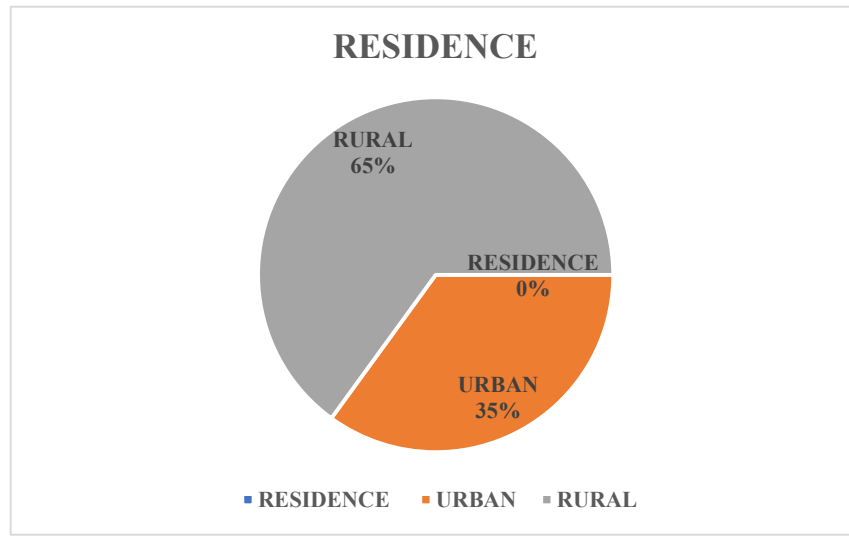


Figure 2: Age Classification in different categories

Table 3: Residence of Subjects

Residence	No of Subjects	Percentage (%)
Urban	70	35
Rural	130	65
<b>Total</b>	<b>200</b>	<b>100</b>

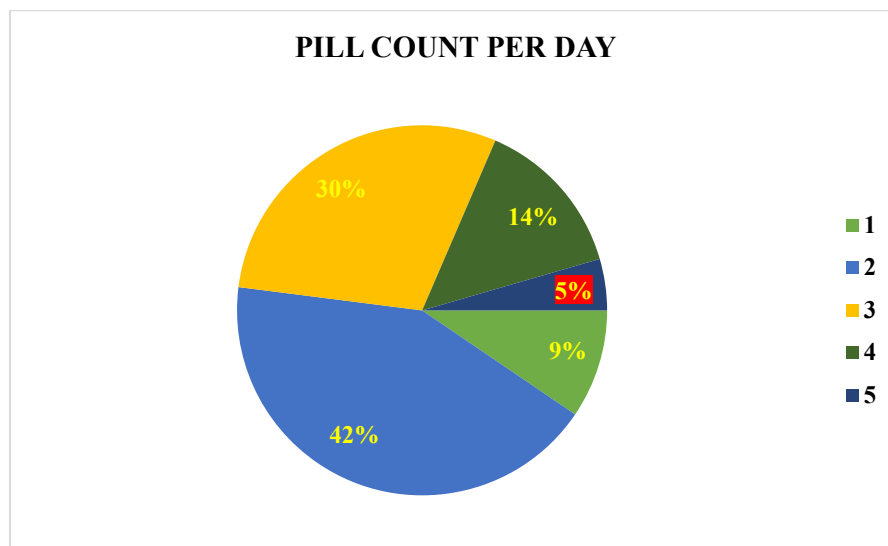


Figure 3: Residence of Subjects

**DEPARTMENT CATEGORIZATION**

Subject were categorized according to pain and out of 200 subject 112 (56%) were surgical pain, 53(26.5%) were post-operative pain and 35 (17.5%) were generalized pain **Table 4 and Figure 4.**

**FREQUENCY OF ADMINISTRATION**

Out of 391 Analgesics 5 (1.27%) Analgesics were Prescribed in OD, 206 (52.68%) Prescribed in BD, 38 (9.71%) Prescribed in TID, 142 (36.31%) Prescribed in SOS as shown in **Table 5 and Figure 5.**

**PRESCRIBING PATTERN OF ANALGESICS**

Aceclofenac was prescribed in 15 (4.1%) prescription, Diclofenac in 74 (20.27%), Paracetamol in 175 (47.94%), Tramadol in 89 (25%), Aspirin in 1 (0.27%), Ketorolac in 1 (0.27%), Naproxen in 6 (1.64%), Etoricoxib in 1 (0.27%), Aceclofenac+ paracetamol in 1 (0.27%), Tramadol Hydrochloride+ Acetaminophen in 1 (0.27%), and Indomethacin in 1 (0.27%) Respectively as shown in **Table 6 and Figure 6.**

**DOSAGE FORM USED IN STUDY**

The most preferred route of administration of analgesics was IV (64.7%), followed by Oral (32.48%) and IM (2.81%) Respectively as shown in **Table 7 and Figure 7.**

**COMORBIDITIES**

Out of 200 subjects, 21 (10.5%) with DM, 17(8.5) With Hypertention,5(2.5%) with DM+HTN, 1(0.5%) with Denovodiabetic,

1(0.5%) with Denovo HTN, 1(0.5%) with DM+HTN+CAD, 2(1%) with Hypothyroidism, 1(0.5%) Hypothyroidism + Hypertension, 1(0.5%) with ischemic stroke, 1(0.5%) with RA,1(0.5%) with S/E ,1(0.5%) with TB and 147(73.5%) with no comorbidities as shown in **Table 8 and Figure 8.**

**PILL COUNT PER DAY OF ANALGESICS**

Out of 200 subjects prescribed with analgesics, the maximum pill count per day with is 2 in 85(42.5%) subjects, followed by 3 in 59(29.5%), 4 in 28(14%) subjects ,1 in 19 (9.5%) and 5 in 9(4.5%) respectively as shown in **Table 9 and Figure 9.**

**MISCELLANEOUS DRUGS**

Out of 200 subjects in 167 subjects miscellaneous Drugs are used in pain relieve Buscopam in 9(5.38%), Chymoral forte in 64 (38.32%), Fevastin in 7 (4.19%), Flupiritine in 1(0.59%), Goodwin in 1 (0.59%), Hifenac P in 1(0.59%), Nixflam P in 5 (2.99%), Rutopace D in 8(4.79%), Seraforte in 1 (0.59%), Tapal in 8 (4.79%) and Trypace in 62(37.12%) subjects respectively as shown in **Table 10 and Figure 10.**

**PHARMACOLOGICAL CLASS OF ANALGESICS**

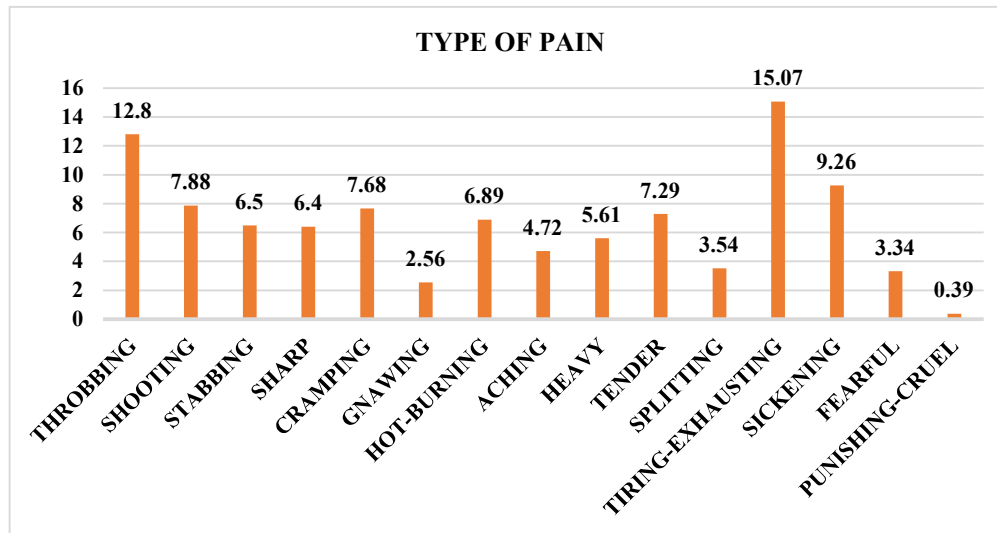
The pharmacological class of analgesics used in 200prescription are Non- opioids in 203 (51.91%), selective cox-2 inhibitors in 1 (0.25%), synthetic opioids in 90(23.0.1%),

Non-selective cox-inhibitors in 6(1.53%), preferential cox-2 inhibitors in 90(23.01%), and Acetic acid derivatives in 1(0.25%)

subjects respectively as shown in **Table 11** and **Figure 11**.

**Table 4: Department categorization**

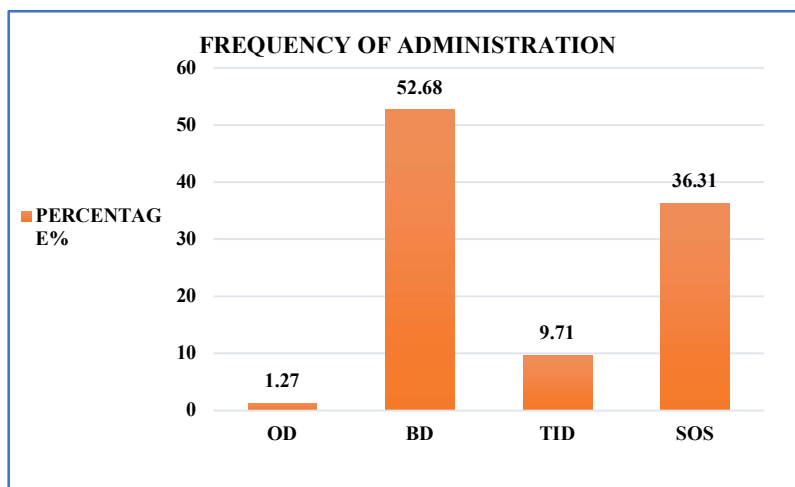
Department	No of Subjects	Percentage (%)
Surgical Pain	112	56
Post-Operative pain	53	26.5
Generalized pain	35	17.5
Total	200	100



**Figure 4: Department categorization**

**Table 5: Frequency of administration of analgesics**

Frequency of Administration	No of analgesics	Percentage (%)
OD	5	1.27
BD	206	52.68
TID	38	9.71
SOS	142	36.31
Total	391	100



**Figure 5: Frequency of administration of analgesics**

Table 6: Prescribing pattern of analgesics

Analgesics	Frequency	Percentage
Aceclofenac	15	3.83
Diclofenac	74	18.92
Paracetamol	175	44.75
Tramadol	116	29.66
Aspirin	1	0.25
Ketorolac	1	0.25
Neproxen	6	1.53
Etoricoxib	1	0.25
Aceclo +Paracetamol	1	0.25
Indomethacin	1	0.25
Total	391	100

Figure 6: Prescribing pattern of analgesics

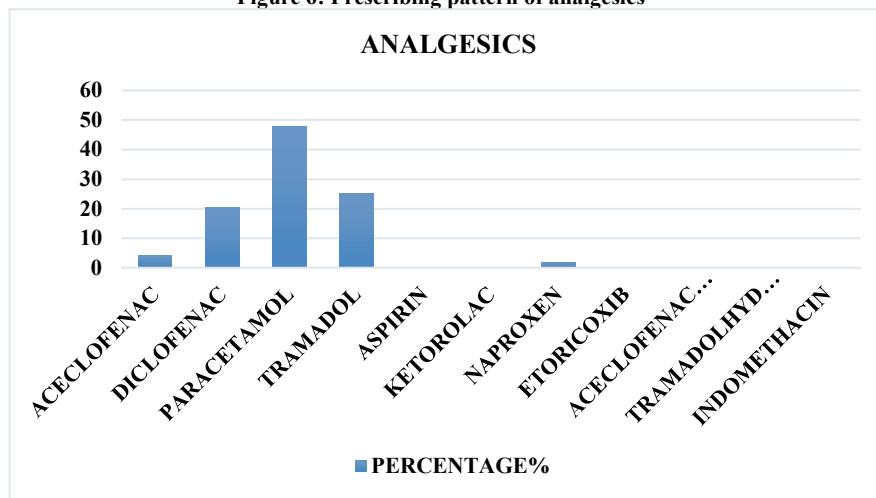


Table 7: Route of Administration of analgesics

Route of administration	No of Analgesics	Percentage (%)
Oral	127	32.48
IV	253	64.7
IM	11	2.81
Total	391	100

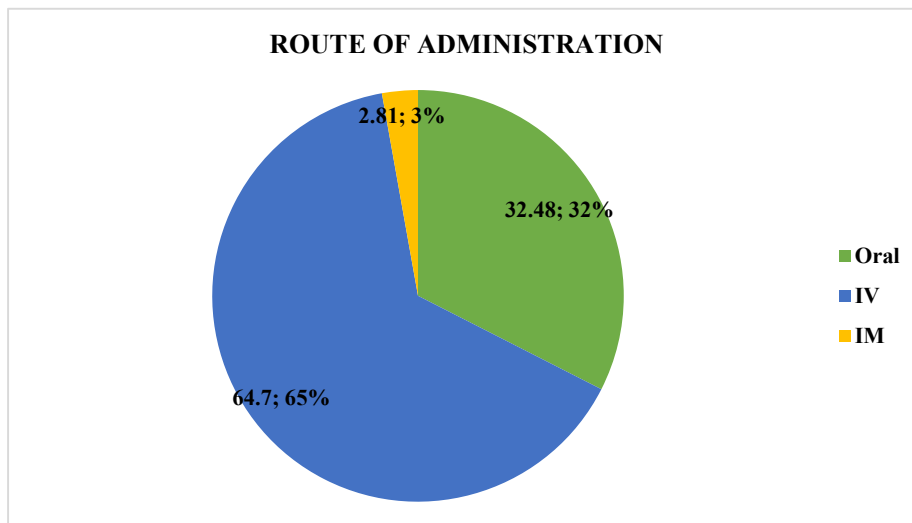


Figure 7: Route of Administration of analgesic

Table 8: Comorbidities

Comorbidities	No. of Subjects	Percentage%
Dm	21	10.5
Htn	17	8.5
Dm+Htn	5	2.5
Denovodiabetic	1	0.5
Denovohtn	1	0.5
Dm+Htn+Cad	1	0.5
Hypothyrodism	2	1
Hypothyrodism + Htn	1	0.5
Ischemiac Stroke	1	0.5
Ra	1	0.5
S/E	1	0.5
Tb	1	0.5
No Comorbidities	147	73.5
Total	200	100

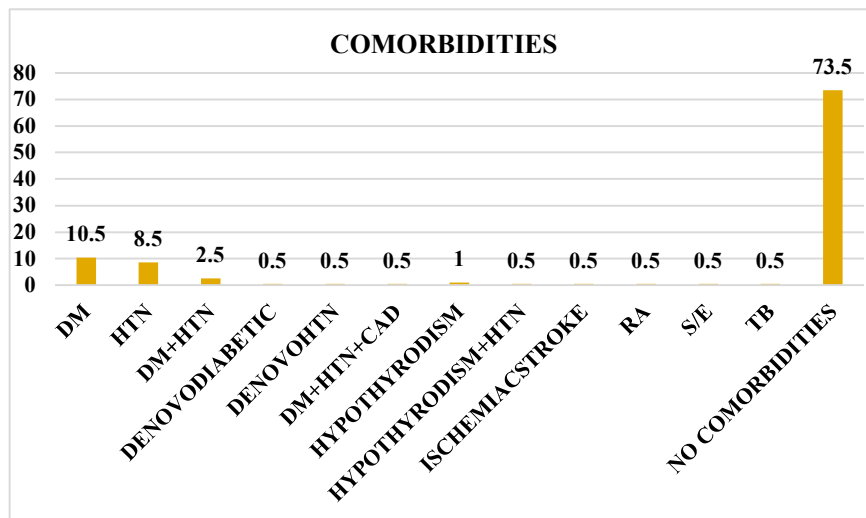


Figure 8: Comorbidities

Table 9: Pill count per day of analgesics

Pill Count/Day	Frequency	Percentage%
1	19	9.5
2	85	42.5
3	59	29.5
4	28	14
5	9	4.5
Total	200	100

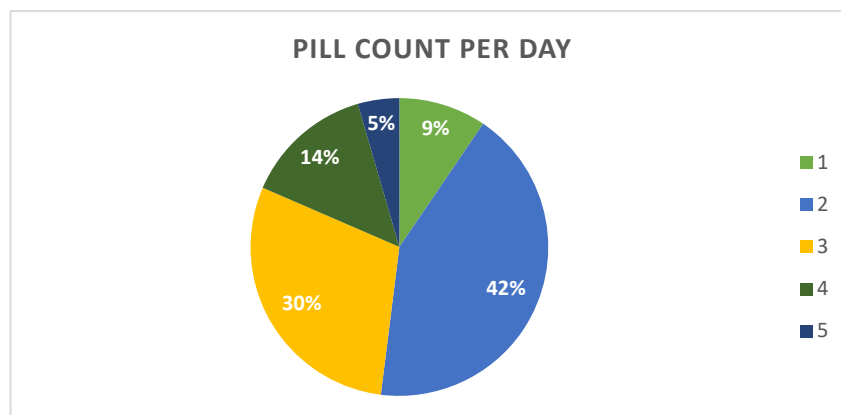


Figure 9: Pill count per day of analgesics

Table 10: Miscellaneous drugs

Miscellaneous Drugs	No Of Drugs	Percentage%
Buscopan	9	5.38
Chymoralforte	64	38.32
Fevastin	7	4.19
Flupiritine	1	0.59
Goodwin	1	0.59
Hifenac P	1	0.59
Nixflam P	5	2.99
Rutopace D	8	4.79
Seraxforte	1	0.59
Tapal	8	4.79
Trypace	62	37.12
Total	167	100

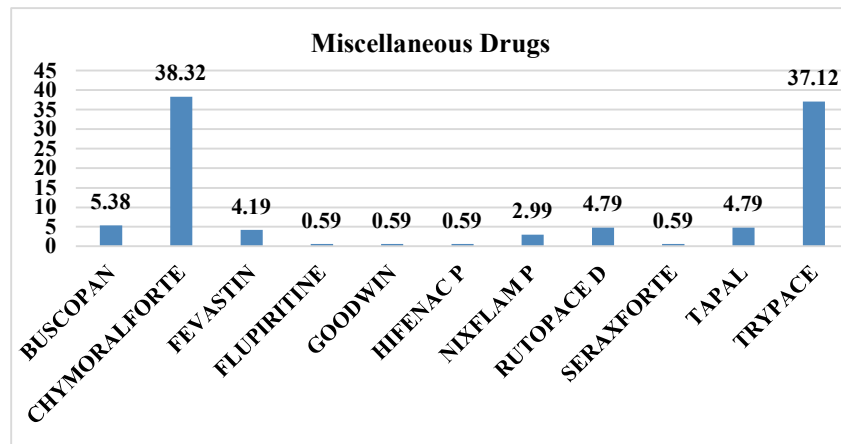


Figure 10: Miscellaneous drugs

Table.11: Pharmacological class of analgesics

Pharmacological class	Num of analgesics	percentage%
Non Opiods	203	51.91
Selective Cox2 Inhibitors	1	0.25
Synthetic Opiods	90	23.01
Non Selective Cox Inhibitors	6	1.53
Preferential Cox2 Inhibitors	90	23.01
Acetic Acid Derivatives	1	0.25
Total	391	100

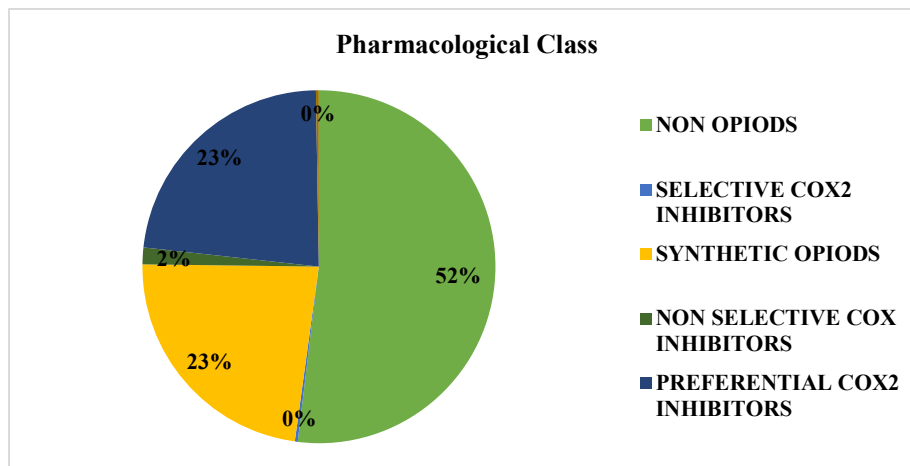


Figure 11: Pharmacological class of analgesics

**TYPE OF PAIN**

The type of pain collected from 200 subjects through McGill questionnaire form are as throbbing in 130(12.8%), shooting in 80(7.88%), stabbing in 66(6.55), sharp in 65(6.4%), cramping in 78(6.89%), Growing in 26(2.56%), hot-burning in 70(6.89%), Aching in 48(4.72%), heavy in 57(5.61%), tender in 74(7.29%), splitting in 36(3.54%), tiring -exhausting in 153(15.07%), sickening in 94 (9.26%), fearful in

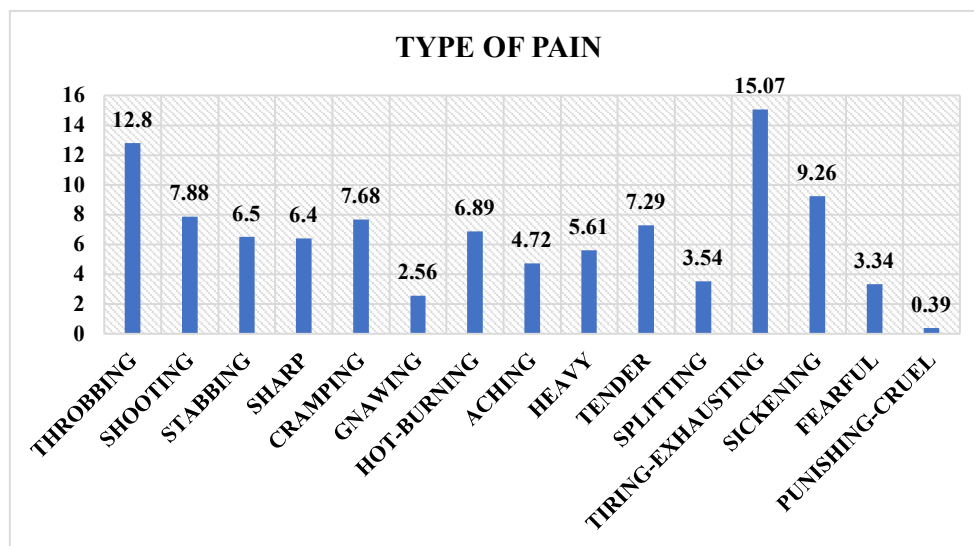
34(3.34%), and punishing-cruel in 4(0.39%), subjects respectively as shown in **Table 12 and Figure 12.**

**PAIN SEVERITY**

Pain severity out of 200 subjects are as No pain in 3(1.5%), Mild in 51(25.55), Moderate in 106(53%), Severe in 38(19%), and worst possible pain in 2(1%) subjects respectively as shown in **Table13 and Figure 13.**

**Table 12: Type of Pain**

Type Of Pain	No. Of Subjects	Percentage%
Throbbing	130	12.80
Shooting	80	7.88
Stabbing	66	6.5
Sharp	65	6.4
Cramping	78	7.68
Gnawing	26	2.56
Hot-Burning	70	6.89
Aching	48	4.72
Heavy	57	5.61
Tender	74	7.29
Splitting	36	3.54
Tiring-Exhausting	153	15.07
Sickening	94	9.26
Fearful	34	3.34
Punishing-Cruel	4	0.39



**Figure 12: Type of Pain**

Table 13: Pain severity

Pain Severity	No. of Subjects	Percentage%
None	3	1.5
Mild	51	25.5
Moderate	106	53
Severe	38	19
Worst Possible Pain	2	1
Total	200	100

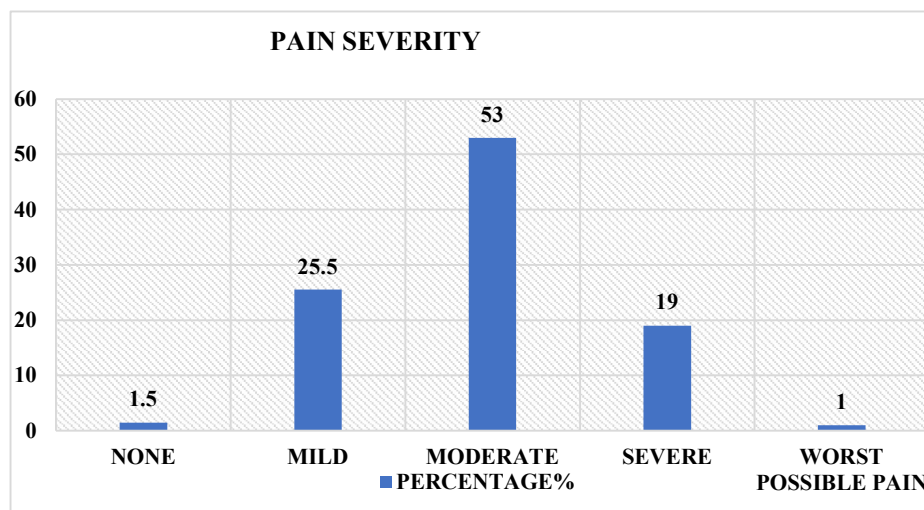


Figure 13: Pain severity

## DISCUSSION:

As per our study, total of 391 analgesics are used among the 200 patients. And out of 200 subjects more no of subjects taking analgesics are male 61% and female 39%. as per our study, most of the individuals taking analgesics are seen in the age groups of 31-40 years, i.e.25%. And the most common reason for taking analgesics are surgical pain i.e. 56%. Among the 391 analgesics used, the most frequently used analgesics is paracetamol 44.75%, followed by tramadol 29.66%, diclofenac 18.92%, Aceclofenac,3.83%, Naproxen,1.53% and aspirin, ketorolac, Etoricoxib Indomethacin used as 0.25%.

## CONCLUSIONS

Analyze drug use in accordance with guidelines or giving suggestions to change prescribing patterns is challenging without knowledge of the drug prescriptions and usage. The study indicated that the prescription pattern of analgesics (e.g., incorrect dosage or multiple drug use) was not reasonable because it could result in therapy drawbacks, adverse drug reactions, expensive treatment, or death.

Prescription errors in India are mostly caused by the lack of opportunities for clinical pharmacist to participate in prescription supervision. One possible function in the healthcare system is to help doctors change the number of medications that patients.

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