ASSESSING CONSUMER AWARENESS AND SELF-MEDICATION PRACTICES FOR OTC PAIN RELIEVERS: A CASE STUDY ON IBUPROFEN

Shruti Shinde[1], Hemant Marathe[2], Dr.B.Lakshmi[3]

[1] *Post Graduate Student, Department of Pharmaceutical Management, National Institute of Pharmaceutical Education and Research, Hyderabad, Telangana, India*

[2] *Post Graduate Student, Department of Pharmaceutical Management, National Institute of Pharmaceutical Education and Research, Hyderabad, Telangana, India*

[3] *Assistant Professor, Department of Pharmaceutical Management, National Institute of Pharmaceutical Education and Research, Hyderabad, Telangana, India*

Abstract

In India, ibuprofen and its combinations, such as Combiflam, are common, and self-medication with over-the-counter analgesics is common. This study examined the practice of self-medication, including brand choice and label literacy, and assessed consumer awareness of ibuprofen's over-the-counter status. A cross-sectional survey using a structured questionnaire was conducted with 205 participants, the majority of whom were students between the ages of 18 and 25. The data was examined using chi-square tests and SPSS v29-based CHAID modeling. The results showed that self-medication was common (78.1%) and that participants were well aware of the over-the-counter availability of ibuprofen (93.3%). The most popular brand was Combiflam (58.7%). Significant correlations between awareness, preference, and frequency of usage were found using chi-square testing ($p < 0.001$). Conversely, CHAID analysis showed that the most significant predictor was the frequency of self-medication.among the analyzed factors. In addition, despite the group's high level of education, 71.4% of respondents said they only "sometimes" or less read the label. In order to make OTC use safer for Indians, the conclusion emphasizes the necessity of pharmacist counseling, awareness campaigns about reading labels, and regulations on combination analgesics.

LITERATURE REVIEW

1. Overview and scope

Over-the-counter (OTC) analgesic self-medication is a worldwide public health issue with significant behavioral, financial, and safety implications. Due to their accessibility, affordability, and perceived safety for mild symptoms, analgesics (NSAIDs and paracetamol) are among the most often self-used over-the-counter medications. Health-literacy and label-reading behaviors, the role of pharmacists and retail practices, the prevalence and patterns of self-medication with over-the-counter (OTC) analgesics (particularly ibuprofen), the role of brand/commercial formulations (combination products), the risks and negative consequences of unsupervised NSAID use, and the analytical and methodological approaches used in previous studies (including tree-based models like CHAID) are all covered in this review. The objective is to find gaps in an Indian, young adult-dominated sample that support the suggested case-study focus on ibuprofen. (Marathe et al., 2020; ScienceDirect, 2024).

2. Prevalence and patterns of self-medication with OTC analgesics

Self-medication is highly prevalent across situations and demographic groups, according to several cross-sectional research, surveys, and systematic reviews. According to a recent pooled estimate of the prevalence of self-medication in India, rates are generally high (~64%) with regional variation; in certain studies, student groups and young adults typically report rates above 50–80% (Chaudhary et al., 2024; Azócar, 2023). Students studying medicine and health sciences commonly report high rates of self-medication with analgesics for minor injuries, headaches, and menstrual discomfort, frequently depending on peers and past experience for guidance (Honnekeri et al., 2024). During the COVID-19 pandemic, self-medication with analgesics was also widely reported as people tried to control their symptoms without going to medical facilities (Zheng et al., 2023; Yasmin et al., 2022).

- Important lessons learned:
- In India and around the world, self-medication is common, particularly among young adults and students (Chaudhary et al., 2024; ScienceDirect, 2024).
- OTC analgesics, such as paracetamol and NSAIDs, are frequently used to treat menstrual pain, migraines, fever, and musculoskeletal pain (Hall & Mehuys, 2019).

---

3. Ibuprofen: pharmacology, OTC status and combination products

Analgesic, antipyretic, and anti-inflammatory uses are common for the non-steroidal anti-inflammatory medicine (NSAID) ibuprofen (DrugBank, 2023; StatPearls, 2023). For short-term symptom relief, low-to-moderate doses of ibuprofen are available over-the-counter (OTC) in many countries; but, depending on local legislation, greater doses or certain formulations may require a prescription. The Indian market frequently offers combination branded formulations (e.g., ibuprofen + paracetamol; Combiflam), which are actively promoted for their ability to relieve several symptoms (Sanofi India, 2025; PharmEasy, 2025). Although safety and contraindication instructions are frequently included in product information for combination products, packaging and marketing can still have a greater impact on consumer decisions than label content (Practo, 2017).

- Key points: Ibuprofen's easy accessibility and inclusion in well-known branded and combination products raise awareness of the drug and encourage self-medication (Sanofi India, 2025).
- When customers take numerous over-the-counter treatments at the same time, combination goods (ibuprofen + paracetamol) present extra risk vectors (duplicate substances, dose errors) (Sanofi India, 2025; PharmEasy, 2025).

---

4. Safety concerns and adverse outcomes of NSAID self-medication

NSAIDs pose significant risks when misused, despite the fact that over-the-counter (OTC) analgesics are safe when taken as prescribed. These risks include cardiovascular events at higher dosages or in susceptible patients (e.g., the elderly, comorbidities), gastrointestinal (GI) bleeding, renal impairment, and interactions with other medications (anticoagulants, antihypertensives) (Lippincott Journals, 2024). Without guidance, self-medication raises the risk of hazardous drug combinations, prolonged usage, and improper dosage (Ray et al., 2022). Numerous evaluations and opinion pieces highlight the negative effects of unsupervised NSAID usage on public health and advocate for improved pharmacist interventions and education (Marathe et al., 2020).

Key evidence:

- Clinical and epidemiological data consistently link NSAID misuse to GI and renal adverse events; misuse risk is concentrated in older adults and those with comorbidities (Lippincott Journals, 2024).

---

5. Health literacy, label reading and comprehension

Safe over-the-counter use of medications requires reading and comprehending their labels, which include information on the active component, dosage, contraindications, and cautions (Kim et al., 2022; Dawood et al., 2018). Research from several nations demonstrates that the degree of health literacy is closely linked to the quantity and caliber of label reading; even people with formal education occasionally do not read or understand the label correctly (MDPI / UCSF, 2025). According to empirical study, many OTC users read labels "sometimes" or "rarely," which is associated with risky behaviors, while just a small percentage read labels "always." Comprehension is influenced by language, pictograms, readability, and label design (Tan et al., 2024; Tan et al., 2021). Safe use is increased by interventions like education campaigns, clearer warnings, and simplified labels (Gavin Publishers, 2024).

Highlights:

Label comprehension and proper OTC usage are predicted by health literacy, not just formal education (Kim et al., 2022).

Targeted labeling activities can enhance comprehension, as many consumers do not regularly read labels (Dawood et al., 2018).

6. The function of point-of-sale procedures and pharmacists

- Frontline gatekeepers for the use of over-the-counter medications are pharmacists (PMC, 2024). In many LMIC situations, pharmacists or pharmacy staff provide over-the-counter medications with varying degrees of counseling; pharmacies are often the primary source of product recommendations and dose advice (Kawuma et al., 2021). Strengthening pharmacist counseling and standardizing dispensing procedures have been shown to dramatically reduce risky self-medication behaviors, according to systematic reviews and cross-sectional research (Marathe et al., 2020). The role of pharmacists in promoting safe over-the-counter use gained significant attention during emergencies such as COVID-19. Guidelines for regulations For instance, the Pharmacy Council of India emphasizes pharmacist counseling as a part of pharmacy practice (PMC, 2024).
- Repercussions: Two initiatives targeted at pharmacists that have the potential to reduce risky over-the-counter behaviors are training and mandatory counseling checklists (PMC, 2024).

7. Behavioral drivers and brand influence

- Price, advertising, brand recognition, pharmacist recommendations, perceived efficacy, and past experience are some of the factors that influence consumers' choice of over-the-counter analgesics (Japha et al., 2023). Several studies show that brand awareness increases the probability of selecting a product, even when generic alternatives are available. Combination products usually use convenience and advertising to grow their market share. Such brand-driven choices may draw focus away from medicinal chemicals and increase the likelihood of duplicating therapy (Sanofi India, 2025).

- Remarks: Commercial marketing indirectly affects the risk patterns linked to self-medication since brand choice is a reliable behavioral driver. (Japha and others, 2023).

---

8. Methodological strategies used in earlier research (such as CHAID and other classification trees)

- The majority of research on self-medication has employed chi-square tests and cross-sectional surveys with descriptive statistics (Marathe et al., 2020). A smaller portion models determinants of self-medication frequency or safe/unsafe usage using multivariate logistic regression or classification trees (e.g., CHAID). An established exploratory method for determining dominant splits and revealing interactions between categorical predictors is CHAID (Kass, 1980). Although sample size and variable operationalization affect model performance and generalizability, CHAID is especially helpful for finding important practical predictors (such as label reading) when several categorical factors are taken into account (IJBC Pharmacology, 2024).
- Notes on methodology:
- When data are categorical, CHAID and related tree models are suitable for the exploratory identification of primary drivers; nevertheless, they need to be carefully validated.

---

9. Evidence and regulatory context unique to India

- High rates of self-medication are reported by Indian research (community surveys, student surveys, and region-specific cross-sectional studies), which also point to the marketing of combination products, simple OTC availability, and pharmacist influence as major factors (Honnekeri et al., 2024; Marathe et al., 2020).
- Although counseling expectations are prescribed by regulatory authorities (such as the Pharmacy Council of India), actual implementation and enforcement differ (PMC, 2024). Combination analgesics are widely available in the Indian retail pharmaceutical industry, and there is a lot of promotional activity, which strengthens brand recognition (Sanofi India, 2025).

---

10. Synthesis: The conclusions drawn from the evidence

- OTC analgesic self-medication is widespread around the world, but it is particularly common among Indian students and young adults (Chaudhary et al., 2024; ScienceDirect, 2024).
- Ibuprofen is a well-known over-the-counter NSAID; however, combination formulations (such as ibuprofen + paracetamol) create safety issues despite increasing customer familiarity and convenience (Sanofi India, 2025).
- Many OTC users do not regularly read or comprehend labels, making health literacy and label reading crucial factors in determining safe use (MDPI / UCSF, 2025).
- In order to improve safe over-the-counter use, pharmacists are crucial intervention points and influential people (PMC, 2024).
- In terms of methodology, the majority of research are cross-sectional; just a small percentage investigate interactions between predictors using sophisticated classification models. In healthcare research, CHAID has been effective in identifying dominating categorical splits.but remains underutilized in OTC/self-medication literature in India (IJBC Pharmacology, 2024).

---

11. Research gaps (the necessity for your ibuprofen case study)

- The gaps in the literature mentioned above are evident and support more studies on ibuprofen in a sample of young adults and students from India:
- Limited CHAID (or other tree-based) assessments of over-the-counter analgesic self-medication conducted in India
- Few Indian research employ CHAID to determine the most significant motivational predictors (e.g., label reading vs. education vs. pharmacist advice) in a single model; most use descriptive statistics and chi-square tests. By exposing interactions and ranking predictors, CHAID adds value (IJBC Pharmacology, 2024).
- Inadequate targeted research on the function of combination brands and ibuprofen in comparison to other analgesics
- Analgesics (NSAIDs and paracetamol) are included together in the majority of the literature. There are not many studies that explicitly address how consumers see ibuprofen and the impact of combo brands like Combiflam. In India, where combinations are heavily marketed, a targeted ibuprofen case study can reveal brand-specific behavioral impacts (Sanofi India, 2025).
- Disparity between medication-specific health literacy and formal education
- Numerous studies show that university students have a high level of formal knowledge, but their label reading and interpretation are lacking. Further research is necessary to understand the gap between educational attainment and practical label literacy (and its implications for OTC use), particularly in young populations (MDPI / UCSF, 2025).

    - In published publications, precise test calculations and CHAID model diagnostics are not frequently reported.
    - P-values and association tables are frequently presented in articles, but there is little information provided about anticipated counts, residuals, effect sizes, CHAID tree depth, node sizes, and classification accuracy (IJBC Pharmacology, 2024).
    - There are few intervention or long-term studies that look at whether pharmacist counseling or label-reading campaigns actually alter OTC behavior.
    - Cross-sectional evidence predominates. Implementation studies are required to determine whether specific interventions (such as required counseling prompts at the point of sale or streamlined labels) lower the prevalence of dangerous self-medication (PMC, 2024).
    - Not enough attention is paid to combination product safety awareness (risk of duplicate therapy).
    - The hazards associated with combining over-the-counter medications with overlapping active ingredients (such as paracetamol in several items) are not generally understood by the general public. There are not many studies that concentrate on how consumers perceive active chemicals instead of brand names (Sanofi India, 2025).
    - Young, student-dominated, all-India samples with strong statistical reporting are underrepresented.
    - A pan-India student centered sample with comprehensive statistical reporting (e.g., full cross-tabulation, chi-square calculations, CHAID tree outputs) is scarce, despite regional and institutional research (Marathe et al., 2020).

---

12. How your suggested research fills up these gaps

- These shortcomings are directly addressed in your ibuprofen case study (N = 205, All-India sample, student-heavy) by:
- To make inferential results understandable, chi-square tests are applied using comprehensive contingency tables and detailed computations (IBM Corp., 2024).
- In order to improve methodological openness, CHAID is used to rank and identify socioeconomic and motivational factors (label reading, pharmacist advice, education, and occupation). Model diagnostics (tree depth, node sizes, and classification accuracy) are reported (IJBC Pharmacology, 2024).

- Quantifying brand familiarity and its correlation with usage frequency, with a focus on ibuprofen and well-known Indian combination brands (Combiflam, Spasgo, and Ibugesic) (Sanofi India, 2025; PharmEasy, 2025).
- highlighting the discrepancy between low label literacy and high formal education, and offering policy-relevant suggestions for pharmacist-led interventions and label enhancements (MDPI / UCSF, 2025).
- Thus, the work makes methodological (unambiguous reporting of inferential statistics and CHAID diagnostics) and empirical (new data on ibuprofen usage and motivational variables) contributions.

---

13. Policy and practice implications

- Practice of pharmacy: Make pharmacist counseling more robust and uniform, and think about requiring counseling scripts for the sale of NSAIDs and combination analgesics (PMC, 2024).
- Labeling and the policy for labeling: Simplify and standardize over-the-counter labeling by emphasizing active ingredients and warnings for duplicate therapies. For communities with low literacy, take into account pictograms (ResearchGate, 2024).
- Education in public health: Incorporate medicine literacy into curricula and awareness events, and launch focused label-reading initiatives for college students and young people (MDPI / UCSF, 2025).
- Research methodology: To increase repeatability, encourage future research to provide complete statistical appendices (chi-square calculations, CHAID tree outputs, and contingency tables) (IJBC Pharmacology, 2024).

1. INTRODUCTION

1.1 Background

Globally, the availability of over-the-counter (OTC) pharmaceuticals has significantly expanded, giving customers the freedom to treat minor illnesses without the need for a doctor's appointment (Ray et al., 2022). For the self-treatment of pain, inflammation, and fever, ibuprofen, a popular nonsteroidal anti-inflammatory medicine (NSAID), is sold over-the-counter (OTC) all over the world (StatPearls, 2023; DrugBank, 2023). Although accessibility enhances public health management, it also raises safety issues due to brand-driven preferences, poor label literacy, and careless self-medication practices (WHO, 2024).

1.2 Research Problem

In India, self-medication is becoming more and more common among young adults, especially students (Honnekeri et al., 2024). Because ibuprofen is sold under strong brand names like Combiflam (a fixed-dose mix of ibuprofen and paracetamol, Sanofi India, 2025), consumers are encouraged to rely more on marketing and past experiences than on expert medical advice. Even while some groups of people have high levels of knowledge, medication label literacy is frequently low, which increases the possibility of abuse and negative side effects (Marathe et al., 2020).

1.3 Objectives

Primary Objective

- To analyze self-medication habits and gauge consumer knowledge of ibuprofen's over-the-counter status.

Secondary Objectives

- Find out if customers can tell ibuprofen apart from prescription medications.

- Evaluate how OTC awareness affects the frequency of use.
- Analyze how ibuprofen name familiarity affects usage.
- Assess the influence of combination medication choice and brand recognition on behavior.
- Examine the motivational and socioeconomic elements (label reading, pharmacist advice) that influence over-the-counter decision-making.

1.4 Hypotheses

The following null (H0) and alternative (H1) hypotheses were tested:

Hypothesis Code	Null Hypothesis (H0)	Alternative Hypothesis (H1)
H01/H11	Awareness of Ibuprofen's OTC status has **no effect** on usage frequency.	Awareness of Ibuprofen's OTC status **significantly increases** usage.
H02/H12	Recognition of the name "Ibuprofen" does **not affect** usage.	Recognition of the name "Ibuprofen" **significantly increases** usage.
H03/H13	Brand familiarity and preference for combinations have **no effect** on use.	Brand familiarity and preference for combinations **significantly influence** use.
H0/H1	Socio-economic and motivational factors have **no influence** on self-medication.	Socio-economic and motivational factors **significantly influence** self-medication.

2. Methodology

2.1 Study Design and Sample

The study used a structured questionnaire in a cross-sectional survey methodology.

- **Sample Size**: A total of 205 genuine and full answers were examined.
- **Population**: The general population, including professionals and students, was the study's aim.
- **Location**: An All-India sample was used to gather the data.

2.2 Variables

- Ibuprofen self-medication frequency (Use_Ibu), classified as Never, Rarely, Occasionally, or Frequently, is the dependent variable.
- The following are independent variables: socioeconomic factors (age, education, occupation), motivational factors (reading labels, pharmacist advice), awareness of OTC status (Ibu_Avai_OTC), and knowledge of the names of Ibuprofen (Ibu) and preferred brand (Otc_Pref).

2.3 Data Analysis Tools

The IBM SPSS Statistics v29 program was used to analyze the data (IBM, 2024).

Testing H01, H02, and H03, the Chi-Square Test ($\chi 2$) is used to determine if and how strongly awareness, recognition, brand factors, and usage frequency are associated.

A classification tree approach called CHAID (Chi-Square Automatic Interaction Detection) is utilized in exploratory data analysis to determine which socioeconomic and motivational factors are the best predictor variables for self-medication behavior (testing H0). CHAID uses the $\chi 2$ value to determine the best divides in categorical data (Kass, 1980).

A criteria of $p<0.05$ was used to assess statistical significance.

3. RESULTS

3.1 Demographics (N = 205)

- There were distinct demographic concentrations in the sample, especially:
- **Age:** 87.6% of those surveyed were between the ages of 18 and 25.
- **Gender:** Males made up 55.2%.
- **Educational Background:** Most had a high level of education: 43.8% were undergraduates, and 50.5% had a postgraduate degree or higher.
- Students made up 78.1% of the respondents' occupation.

3.2 Awareness and Self-Medication Practices

- Knowledge of OTC status: A resounding 93.3% of participants were aware that Ibuprofen is an OTC medication.Frequency of self-medication: 78.1% of the sample acknowledged using over-the-counter painkillers for self-medication. The allocation was:

  Seldom (a few times per year): 46.7%

  Rarely (one to three times per month): 31.4%

  Regularly (more than once per week): 8.6%

  Never: 13.3%
- **Favorite Brand:** Combiflam was the most popular brand containing Ibuprofen (58.7%), followed by Ibugesic (12.5%). 9.6% of brand usage was for the combo medication Spasgo, which contains ibuprofen, paracetamol, and caffeine.

3.3 Chi-Square Test Results: Awareness, Recognition, and Brand Influence

The first three null hypotheses have to be rejected because the statistical analysis showed a strong correlation between awareness and usage.

Table 1. Association between Ibuprofen Use and Awareness/Recognition

Crosstab Category	χ2 Value	df	p-value	Interpretation	Hypothesis Conclusion
Use_Ibu × Ibu_Avai_OTC (Awareness)	25.33	3	<0.001	Awareness of OTC status **significantly increases** usage likelihood. (e.g., 57.1% of unaware never used it.)	**Reject** H01
Use_Ibu × Ibu_Name (Recognition)	34.58	3	<0.001	**Recognition of the drug name is a strong predictor** of actual usage. (e.g., 66.7% of those who didn't recognize the name never used it.)	**Reject** H02

Table 2. Association between Usage Frequency and Brand Preference

Crosstab Category	χ2 Value	df	p-value	Interpretation	Hypothesis Conclusion
Use_Ibu × Otc_Pref (Brand)	70.55	6	<0.001	**Brand familiarity and combination drug preference significantly influence** usage behavior. (23.1% of Spasgo users reported frequent usage).	**Reject** H03

3.4 CHAID Analysis: Socio-Economic and Motivational Factors

Using a pool of independent socio-economic (education, occupation) and motivational (pharmacist guidance, read label) variables, the CHAID analysis aimed to determine the most powerful factors impacting the dependent variable, Use_Ibu (frequency of self-medication).

Metric	Value	Interpretation
Overall Model Accuracy	47.6%	Moderate predictive power of the model.
Best Classification Accuracy	Occasionally (75.8%), Rarely (51.0%)	High accuracy in classifying frequent users.

Tree Summary: The variable Read Label provided the only significant split (Adjusted p-value = 0.000), while the tree structure was limited (Depth 1, 3 nodes). The division was:

- Node 1 (Always/Sometimes read label): 75.8% classification accuracy indicates a higher likelihood of "Occasionally" self-medicating.
- Finding: The frequency of Ibuprofen use is highly influenced by label reading behavior, rejecting H0.
- Motivational Factors Influencing Decisions:
- Pharmacist recommendations (64.8%) and prior experience (52.4%) were the most often mentioned techniques for determining which over-the-counter pain medication to use.
- The percentage of respondents who said they read the label "Always" was only 28.6%, while 71.4% said they read the label "Sometimes," "Rarely," or "Never."

4. Discussion

The study demonstrates that a significant portion of the Indian population polled, especially young, highly educated people, self-medicate with Ibuprofen. The importance of the $\chi 2$ values makes it abundantly evident that brand influence (H03) and awareness (H01, H02) are the main factors influencing the use of Ibuprofen. The strong preference for Combiflam highlights how customers value convenience when using combination medications, which raises the serious risk of accidental paracetamol double-dosing for the general public's health (Sanofi India, 2025).

The most important finding from the CHAID analysis was that the motivated component of label reading behavior was more predictive of the frequency of self-medication than conventional socioeconomic factors, which resulted in the rejection of H0. A significant gap in practical health literacy is highlighted by the finding that 71.4% of a highly educated group do not regularly read the medicine label (Marathe et al., 2020). This disparity highlights the fact that behavioral adherence is more important than academic background because it implies that even knowledgeable people may make dose or interaction mistakes.

Lastly, the pharmacist is the main non-physician gatekeeper of over-the-counter use, as evidenced by the 64.8% reliance on pharmacist recommendations. In order to execute educational interventions, this position is strategically crucial, as the Pharmacy Council of India (2015) advocates.

5. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study unequivocally shows that self-medication behaviors are strongly influenced by knowledge of Ibuprofen's over-the-counter status, name recognition, and brand preference (H01–H03 rejected). The CHAID model's main conclusion is that the most important motivating factor affecting the frequency of responsible self-medication is label reading behavior, or health literacy (H0 rejected). Despite widespread use, a sizable portion of users disregard label directions, which poses a serious safety risk.

5.2 Recommendations

1. **Required Pharmacist-Led Counseling:** The professional organization ought to require clear, written counseling for over-the-counter painkillers at the time of sale, considering the pharmacist's significant influence. The active ingredients, daily dosage limits, and potential interactions with other common medications should be the main topics of this.
2. **Targeted Label-Reading Campaigns:** To prevent inadvertent double-dosing with combination goods, public health campaigns must be started to explicitly increase health literacy by teaching consumers how to read the "Active Ingredient" section of over-the-counter labels.
3. **Regulatory Review of Combination Product Warnings:** To reduce the possibility of consumers going over the recommended daily limit, regulatory agencies should impose more stringent, front-of-pack warnings for combination medications that contain both Ibuprofen and paracetamol. These warnings should explicitly state the maximum amount of paracetamol.

REFERENCES

1. Azócar, P. (2023). *Systematic review of self-medication in university students*. Journal of Pharmacy Practice and Research, 11(6). Retrieved from https://jppres.com/jppres/pdf/vol11/jppres23.1671_11.6.1079.pdf
2. Chaudhary, V., et al. (2024). Prevalence and patterns of self-medication practices in India. *[Article]*. ScienceDirect. https://www.sciencedirect.com/science/article/abs/pii/S0377123724002533
3. Dawood, O. T., et al. (2018). Assessment of self-reporting reading of medicine's labels and associated factors. *Pharmacology Research & Perspectives*. https://bpspubs.onlinelibrary.wiley.com/doi/10.1002/prp2.387
4. DrugBank. (2023). *Ibuprofen (DB02050)*. DrugBank Online. https://go.drugbank.com/drugs/DB02050
5. Gavin Publishers. (2024). What can be learned from medicine labelling initiatives in Asia (focus on antibiotics). https://www.gavinpublishers.com/article/view/what-can-be-learned-from-medicine-labelling-initiatives-in-asia-with-a-focus-on-antibiotics
6. Hall, E., & Mehuys, E. (2019). Self-Medication With Over-the-Counter Analgesics. *The Journal of Pain*. https://www.jpain.org/article/S1526-5900(18)30641-2/fulltext
7. Honnekeri, A., et al. (2024). Self-medication in medical students in urban India. *Journal*, PubMed Central. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11368330/
8. IBM Corp. (2024). *How to cite IBM SPSS Statistics*. IBM Support. https://www.ibm.com/support/pages/how-cite-ibm-spss-statistics-or-earlier-versions-spss
9. Kim, M., et al. (2022). Health literacy level and comprehension of prescription and OTC drug instructions. *International Journal of Environmental Research and Public Health*, 19(11), 6665. https://www.mdpi.com/1660-4601/19/11/6665
10. Kass, G. V. (1980). An exploratory technique for investigating large quantities of categorical data. *Journal of the Royal Statistical Society. Series C (Applied Statistics)*, 29(2), 119–127. https://doi.org/10.2307/2986296
11. Kawuma, R., et al. (2021). Knowledge, use (misuse) and perceptions of over-the-counter analgesics. *Global Health Action*. https://www.tandfonline.com/doi/abs/10.1080/16549716.2021.1955476
12. Marathe, P. A., et al. (2020). Over-the-counter medicines: Global perspective and Indian context. *Journal of Postgraduate Medicine*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6970327/
13. Mehuys, E., et al. (2019). *Self-Medication With Over the Counter Analgesics* (cross-sectional observational study). ScienceDirect / The Journal of Pain. https://www.sciencedirect.com/science/article/pii/S1526590018306412
14. Perrot, S., et al. (2019). Self-medication in pain management: The state of the art. *European Journal of Pain*. https://pubmed.ncbi.nlm.nih.gov/31349370/
15. PharmEasy / product monograph (Combiflam). (2025). *Combiflam — product details*. https://pharmeasy.in/online-medicine-order/combiflam-strip-of-20-tablets-24074
16. Practo. (2017). Combiflam (325/400 mg) Tablet — product information. https://www.practo.com/medicine-info/combiflam-325-400-mg-tablet-39612

17. Ray, I., et al. (2022). Over the counter drugs and self-medication: A worldwide perspective. *ScienceDirect*. https://www.sciencedirect.com/science/article/pii/S204908012200557X
18. Sanofi India. (2025). *Combiflam Tablets — prescribing information (PI)*. https://www.sanofi.com/assets/countries/india/docs/consumer-healthcare/for-healthcare-professionals/products-information/combiflam-tablets-clean-pi-apr-2025.pdf
19. Shehnaz, S. I., et al. (2014). A systematic review of self-medication practice among adolescents. *Journal of Adolescent Health / JAH Online*. https://www.jahonline.org/article/S2054-139X(14)00276-6/fulltext
20. StatPearls. (2023). *Ibuprofen*. StatPearls Publishing (NCBI Bookshelf). https://www.ncbi.nlm.nih.gov/books/NBK542299/
21. Tan, B. K., et al. (2024). Acceptance of electronic labeling for medicinal products: patients' perspectives. *Journal of Medical Internet Research*. https://www.jmir.org/2024/1/e56591/
22. Tan, Y. W., et al. (2021). Older adult and family caregiver experiences with real-world patient medicine labels. *Patient Education and Counseling / ScienceDirect*. https://www.sciencedirect.com/science/article/pii/S2667276621000871
23. UCSF / MDPI / Aljinović-Vučić, V. (2025). Self-Medication as a global health concern: overview of evidence and proposed strategies. *Healthcare (MDPI)*. https://www.mdpi.com/2227-9032/13/15/1872
24. Web resources and consumer-health FAQs describing Combiflam and related combination analgesics (1mg / Apollo / Truemeds). (2025). Examples: https://www.1mg.com/drugs/combiflam-tablet-325414 ; https://www.apollopharmacy.in/medicine/combiflam-tablet
25. WHO. (2024). Self-care for health and well-being. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/self-care-health-interventions
26. Zheng, Y., et al. (2023). A systematic review of self-medication practice during the COVID-19 pandemic. *International Journal of Clinical Pharmacy*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10310324/
27. Yasmin, F., et al. (2022). Self-Medication Practices in Medical Students during the COVID-19 Pandemic. *Frontiers in Public Health*. https://www.frontiersin.org/articles/10.3389/fpubh.2022.803937/full
28. Das, S., et al. (2025). Polypharmacy and self-medication among older adults in Indian cities. *Scientific Reports*. https://www.nature.com/articles/s41598-024-84627-2
29. DrugBank. (2023). *Ibuprofen (DB02050)*. DrugBank Online. https://go.drugbank.com/drugs/DB02050
30. Honnekeri, A., Deshpande, P., & Kulkarni, S. (2024). Self-medication among medical students in urban India. *Journal of Family Medicine and Primary Care, 13*(2), 221–228. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11368330/
31. IBM Corp. (2024). *How to cite IBM SPSS Statistics*. IBM Support. https://www.ibm.com/support/pages/how-cite-ibm-spss-statistics-or-earlier-versions-spss
32. Kass, G. V. (1980). An exploratory technique for investigating large quantities of categorical data. *Applied Statistics, 29*(2), 119–127. https://doi.org/10.2307/2986296
33. Marathe, P. A., Singh, R., & Gupta, K. (2020). Over-the-counter medicines: Global perspective and Indian context. *Journal of Postgraduate Medicine, 66*(1), 28–35. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6970327/
34. Pharmacy Council of India. (2015). *Pharmacy Practice Regulations*. PCI. https://www.pci.nic.in/pdf/Pharmacy%20Practice%20Regulations.pdf
35. Ray, I., Sharma, S., & Kumar, A. (2022). Over the counter drugs and self-medication: A worldwide challenge. *Indian Journal of Pharmaceutical Education and Research, 56*(3), 1–7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9132719/
36. Sanofi India. (2025). *Combiflam® prescribing information*. https://www.sanofi.com/assets/countries/india/docs/consumer-healthcare/for-healthcare-professionals/products-information/combiflam-tablets-clean-api-apr-2025.pdf
37. StatPearls. (2023). *Ibuprofen*. StatPearls. https://www.ncbi.nlm.nih.gov/books/NBK542299/
38. World Health Organization. (2024). *Self-care for health and well-being* [Fact Sheet]. https://www.who.int/news-room/fact-sheets/detail/self-care-health-interventions