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A Study on Public Perception and Self-Medication Practices with Over-the-Counter (OTC) Drugs

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Abstract

Over-the-counter (OTC) medications are commonly used by individuals for self-medication due to their easy availability and the general belief that they are safe. However, misuse can lead to negative health outcomes, such as adverse reactions, drug interactions, and delays in seeking professional medical care. In a country, like India, where enforcement of drug regulations can vary and socioeconomic factors play a major role, the practice of self-medication is especially widespread. This prospective observational study, conducted between December 2024 and March 2025, aimed to explore patterns of OTC use and assess public awareness. Using a structured questionnaire shared through social media and institutional channels, data were collected from 135 individuals who had used or purchased OTC medicines within the past six months. Most participants were young adults, particularly college students, with an average age of 28 years. Cold and allergy medications, along with analgesics, were the most frequently used drug categories. Pharmacists and doctors emerged as the main sources of information, although more than half of the respondents admitted to not reading medication labels carefully. The Chi-square analysis indicated statistically significant differences in how participants perceived the use of OTC drugs. These findings suggest a strong reliance on OTC medications among the younger, educated population and highlight the need for increased public education and active involvement of pharmacists to encourage responsible and informed self-medication.

Keywords: Consumer behaviour, drug safety, over-the-counter drugs, pharmacist counselling, self-medication

INTRODUCTION

The increasing reliance on over-the-counter (OTC) medications reflects a global shift toward self-managed healthcare. Individuals frequently resort to these readily accessible remedies for minor ailments, often bypassing formal medical consultations. Among college students in particular, OTC use has become normalized due to its convenience and time-saving appeal, with usage patterns evolving significantly during the COVID-19 pandemic [1].

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Despite their wide availability, public understanding of the safe and effective use of OTC medications remains limited. Many consumers are unaware of potential drug interactions, appropriate dosages, and possible side effects. Studies consistently demonstrate that users frequently misuse common pain relievers, such as NSAIDs, without sufficient awareness of the associated health risks [2, 3].

Moreover, the perceived safety of these drugs – reinforced by their non-prescription status – often leads to overuse and complacency [4]. Labelling plays a critical role in medication safety, yet

research indicates that consumers often struggle to interpret dosage instructions and warning labels on packaging [5, 6]. Decisions regarding OTC drug use are frequently influenced less by clinical evidence and more by personal experience, social norms, and promotional content [7–9], which can undermine informed decision-making.

Pharmacists are well-positioned to counsel individuals on the safe use of OTC medications, yet their role remains underutilized in many communities [10]. Additionally, cultural beliefs and national regulatory frameworks influence public confidence in these products, contributing to varying perceptions across regions [11, 12]. The setting in which these medications are purchased – such as pharmacies versus general retail outlets – can further impact public trust in their use [13].

Public knowledge about specific medications, such as paracetamol, remains inadequate, raising concerns about accidental misuse [14]. Evidence from countries including Malaysia and China highlights similar gaps in awareness and a reliance on non-professional sources for guidance [4, 15].

This study aims to assess current knowledge, perceptions, and practices related to OTC drug use, with the goal of informing public health education and policy initiatives.

MATERIALS AND METHODS

Use of Artificial Intelligence

An artificial intelligence (AI) language model (ChatGPT, OpenAI, 2025 version) was used to assist in [editing manuscript text/structuring clinical content/clarifying grammar/summarizing literature] during the drafting stage. The model was not used for data generation or interpretation. All outputs were verified and edited by the authors to ensure accuracy, clinical relevance, and compliance with ethical standards.

Study Design

This study was a cross-sectional, prospective, and observational investigation conducted between December 2024 and March 2025. The study population comprised members of the public, including individuals from various occupational backgrounds as well as homemakers. Data were collected through multiple sources, including online platforms, such as Google Forms and WhatsApp. Additionally, institutional data encompassed responses from both educators and students affiliated with various colleges and universities.

Study Population and Recruitment

Most participants in this study were individuals with educational backgrounds ranging from high school to postgraduate levels, with varying degrees of prior knowledge regarding over-the-counter (OTC) medications. Participants were randomly selected from the general population. We included only those participants who met the defined inclusion criteria in the study.

This study was open to participants of all ages and genders, irrespective of their prior familiarity with over-the-counter (OTC) medications. Eligible participants were individuals who had purchased or used any OTC medications within the preceding six months, were able to understand English, and were willing to participate in the interview process.

Participants with mental illness or cognitive impairments, which could affect their ability to provide accurate responses or valid consent, were excluded from the study. Additionally, individuals currently enrolled in other clinical research studies and those who had never heard of or used OTC medications were also excluded.

Demographic data collected included age, gender, educational level, occupation, and living arrangements. Furthermore, participants' knowledge regarding OTC medications, including their use, side effects, and adverse drug reactions (ADRs), was also documented.

SAMPLE SIZE CALCULATION

The sample size for the study was calculated as follows:

$$n = \frac{(1.96)^2 \cdot 0.5 \cdot (1-0.5)}{(0.084)^2}$$

$$n = \frac{3.8416 \cdot 0.25}{0.007056}$$

$$n = \frac{0.9604}{0.007056}$$

$$n \approx 135.98$$

ASSESSMENT OF THE STUDY

The public frequently uses over-the-counter (OTC) medications to treat minor illnesses on their own. Although they are convenient and less burdening on healthcare systems, improper use can result in negative side effects, drug interactions, and abuse. The purpose of this cross-sectional study is to evaluate the general population's knowledge, attitudes, and self-medication behaviours regarding OTC drug use. Through convenience sampling, data from roughly 135 adult participants will be gathered using a structured questionnaire. Demographic information, common over-the-counter medications, information sources, confidence in medical professionals, and self-medication motivations will all be covered by the tool. Descriptive and inferential statistics will be used to analyse the data to find trends and connections between OTC drug use and demographic characteristics. The study will bring light on possible hazards, fill in knowledge gaps in the public, and offer data for creating focused awareness campaigns. This project helps to strengthen public health strategies regarding OTC drug regulation and education, as well as to encourage responsible self-medication.

The various variables under investigation include OTC drug types, knowledge of OTC drugs, safety of using OTC drugs, severity of OTC drug use, comfort of OTC drugs, significance of OTC drug uses, and the various information sources used to gather the data.

Statistical Analysis

Data was collected using Google Forms and subsequently organized and analyzed in Microsoft Excel 365. Descriptive statistics was employed to summarize participant responses and identify trends. Chi-square tests were used as inferential statistics to assess associations between demographic factors and OTC drug use practices.

Ethics

This was a non-interventional, observational study involving voluntary responses to an anonymous questionnaire. As there was no risk to participants and no identifying personal information collected, written informed consent was not applicable. Participation was entirely voluntary, and implied consent was obtained through completion of the form, as per ICMR guidelines for minimal-risk public health surveys.

RESULTS

A total of 135 subjects were enrolled in the study. Most participants (n = 122, 90.37%) were in the 18–34 years age group, followed by 11 subjects (8.14%) in the 35–54 years group, and 2 subjects (1.5%) aged over 55 years. The mean age of participants was *28.0 ± 6.4 years*.

The study sample comprised 135 participants, of whom *60 (44.4%) were male* and *75 (55.6%) were female*.

Among the 135 participants, the majority were *college students (n = 59, 43.7%)*, followed by *college graduates (n = 47, 34.8%)*, and *postgraduates (n = 25, 18.5%)*. A small proportion were *school-going individuals (n = 3, 2.2%)* and *uneducated (n = 1, 0.7%)*. The overall education level had a *mean score of 2.68 ± 0.82*, indicating that most participants had at least some level of college education (Table 1).

Table 1. Categorical distribution of the study population.

S.N.	Category	Frequency (n)	Percentage (%)
1	Residence: Urban	79	58.5
2	Residence: Suburban	20	14.8
3	Residence: Rural	36	26.7
4	Knowledge of OTC: Yes	104	77
5	Knowledge of OTC: No	31	23
6	Used OTC: Yes	119	88.1
7	Used OTC: No	16	11.9

In the current study, most participants (85.9%) reported not exceeding a single dose of an over-the-counter (OTC) medication, whereas 19 participants (14.1%) acknowledged taking more than one dose. Regarding the frequency of OTC medication use, 42.2% indicated occasional use, followed by 22.2% who used them rarely, 20.7% often, and 14.1% consistently. A small proportion (0.7%) reported never using OTC drugs.

Regarding the difficulty level of understanding instructions prior to OTC use, most participants (78; 57.8%) found the instructions very easy to understand (Level 1). Conversely, only 6 participants (4.4%) reported the highest difficulty (Level 5).

Participants reported relying on multiple sources of information regarding over-the-counter (OTC) medications. Pharmacists were the most frequently consulted source, with 76 participants (56.3%) seeking their advice, followed by doctors or physicians, consulted by 65 participants (48.1%). Reputable internet websites were used by 37 participants (27.4%). Additional sources included family or friends (36 participants, 26.7%), general internet searches (27 participants, 20%), product packaging (10 participants, 7.4%), social media (6.7%), and television or radio advertisements (2.2%).

A statistically significant association was found between participant responses and the evaluated parameters of OTC drug usage ($\chi^2 = 497.96$, df = 28, $p < 0.001$). Responses varied markedly across categories, reflecting distinct public attitudes. For instance, 57.8% of participants rated the "importance of label reading" as the highest priority (Rating 1), underscoring its perceived criticality.

Conversely, concerns about "potential drug interactions" and "safety and effectiveness of OTC medications" were predominantly rated 4 or 5 (42.2% and 45.9%, respectively), indicating heightened vigilance. Moderate usage patterns emerged for "OTC drug use" (49.6% and 42.2% in Ratings 2 and 3), while "comfort with OTC drugs" showed a more balanced distribution across ratings.

Variability in responses further highlighted divergent behaviors, with high standard deviations in "usage" (SD = 21.50) and "label reading" (SD = 19.29), contrasting with more stable opinions on "comfort levels" (SD = 9.83). These findings collectively illustrate multifaceted public perceptions, shaped by priorities, such as safety awareness, habitual use, and health literacy (Table 2).

DISCUSSION

The demographic profile of the study highlights key trends in over-the-counter (OTC) medication use. A significant majority of participants were young adults aged 18–34 years (90.37%), with a mean age of 28.0 ± 6.4 years, reflecting a demographic more inclined toward self-medication – likely due to increased digital access to health information and the convenience of OTC remedies. A slight female

predominance (55.6%) aligns with existing literature suggesting that women are generally more engaged in self-care practices. Most participants were well-educated, with a mean education score of 2.68 ± 0.82, and a substantial proportion were college students (43.7%). This suggests a relatively informed cohort capable of making autonomous healthcare decisions. However, higher education levels do not necessarily equate to rational medication practices, underscoring the importance of targeted awareness campaigns. These findings are supported by Ganapa et al. (2019), who similarly observed increased OTC use among individuals aged 18–30 years, as well as higher usage among females and students [16].

Table 2. Parameters to determine the safety & effectiveness of the study population.

S.N.	Parameters	Rating (1)	Rating (2)	Rating (3)	Rating (4)	Rating (5)	Statistical Test Results
1	Comfort level with OTC drugs	20	23.7	35.6	14.8	5.9	
2	Importance of label reading	57.8	15.6	13.3	8.9	4.4	
3	Usage of OTC drugs	8.15	49.63	42.22	0	0	
4	Usage of OTC drug in minor health problems	0.7	22.2	42.22	20.7	14.1	
5	Safety of OTC medications	8.9	26.7	48.9	11.1	4.4	
6	Therapeutic efficacy of OTC medications	14.1	43.7	31.1	8.9	2.2	
7	Concerned about potential interactions between OTC medication	0	0	38.5	19.3	42.2	
8	Risk-benefit profile of OTC medications	0	0	34.8	19.3	45.9	
	Chi-square test results						$\chi^2 = 497.96$, $df = 28$, $p < 0.001$.

Geographically, 58.5% of participants resided in urban areas, followed by 26.7% in rural and 14.8% in suburban areas. Regarding awareness, 77% reported some knowledge of OTC medications, while 23% acknowledged having none. Usage was widespread, with 88.1% of participants having used OTC medications at least once. The most frequently used categories included cold and allergy medications (74.8%) and pain relievers (64.4%). Other commonly reported OTC drugs were first-aid products (53.3%), antacids (47.4%), and cough suppressants (46.7%). Digestive aids (39.3%) and supplements (38.5%) were also reported, whereas usage of antidiarrheals (20%), laxatives (12.6%), and miscellaneous OTC drugs (3.7%) was less common. These patterns are consistent with findings by Eduardo S. et al. and Ahmed M. et al., who reported high OTC usage in urban populations with preference for cold medications and analgesics [17, 18].

Participants' perceptions varied across multiple domains. Most respondents reported a "moderate comfort level" with OTC use (35.6%), while only 5.9% expressed a "very high comfort level". Alarmingly, 57.8% rated the importance of reading medication labels at the "lowest level", indicating a gap in awareness that may lead to misuse. The frequency of use was largely reported as moderate (42.2%) to frequent (49.6%), with no participants indicating very high use.

Information sources influencing OTC use varied. Pharmacists were the most consulted (56.3%), followed by doctors (48.1%) and reputable online platforms (27.4%). Others relied on family/friends (26.7%), general internet searches (20%), product packaging (7.4%), social media (6.7%), and TV/radio advertisements (2.2%). These findings mirror those of Alharthi et al. (2024), who also found that individuals rely on a combination of healthcare professionals and online information for guidance on OTC use [19]. This dual reliance underscores the growing influence of digital health information while reinforcing the enduring trust placed in pharmacists.

Regarding the use of OTC drugs for minor health issues, 42.2% of participants indicated *moderate* reliance, and 14.1% reported *very high* reliance. Perceptions of safety were largely *moderate* (48.9%),

with fewer participants rating OTC drugs as very safe. Similarly, *43.7%* rated OTC medications as moderately effective. While concerns about drug interactions were significant (42.2% expressed high concern), 38.5% maintained a neutral stance. Interestingly, overall perceptions of the safety and effectiveness of OTC medications were largely *favourable*, with 45.9% giving them a very high rating.

These findings echo those of Taylor et al. (2023), who reported that while consumers generally perceive OTC medications as effective and safe for minor ailments, concerns regarding misuse, potential interactions, and inadequate professional guidance remain persistent [20]. Both studies reflect a recurring pattern of *measured trust*, tempered by caution and gaps in health literacy, reinforcing the need for clearer labelling, pharmacist engagement, and broader health education.

A statistical analysis revealed significant variation in participants' perceptions of OTC medication use, including comfort, frequency, safety, and effectiveness. This suggests that attitudes are not homogenous and are likely influenced by individual-level factors, such as educational background, prior experience, and exposure to reliable sources of information. These meaningful differences underline the necessity for *personalized and demographically tailored* public health interventions.

The study is limited by its sample, which predominantly included young, educated, and urban participants, thereby restricting generalizability to the broader population. As a cross-sectional, self-reported survey, responses may be influenced by recall or social desirability bias. Additionally, the use of a non-validated questionnaire may affect the reliability of the findings.

CONCLUSIONS

OTC use is prevalent among young, educated individuals. Improving public awareness and pharmacist-led counselling is essential for promoting safer self-medication practices.

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