International Journal of Pharmaceutical and Clinical Research

ISSN Print: 2664-7591
ISSN Online: 2664-7605
Impact Factor: RJIF 8-16
IJPCR 2025; 7(2): 59-64
www.pharmaceuticaljournal.in
Received: 09-05-2025
Accepted: 14-06-2025

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A cross-sectional study of knowledge, attitude and practice regarding self-medication of over-the-counter drugs amongst diploma pharmacy students of a pharmacy college at Manipur

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DOI: https://www.doi.org/10.33545/26647591.2025.v7.i2a.136

Abstract
India is one of the major suppliers of generic medication in the world and billions of drugs are available in the market, consequence to higher chances of irrational use. Majority of the patient or their representative visits pharmacy instead of consulting physician for minor ailments. Hence, the cross-sectional survey was conducted to assess the KAP regarding self-medication on Over-The-Counter drugs of pharmacy students. It was found that the participants have good knowledge on Over-The-Counter medication i.e. 93.54% participants have knowledge that Over-The-Counter drugs can be purchased without prescription and 88.7% responders knew that Pharmacist can recommend Over-The-Counter medications. 82.26% respondents have awareness regarding the safety during pregnancy while using Over-The-Counter drugs. 66.13% of the respondents believe that sharing of Over-The-Counter drugs with other is unsafe and 88.7% participants have the opinion that pharmacist's advice is required while using Over-The-Counter drugs. In minor ailments such as headache, diarrhoea, common cold, body pain, etc. 80.6% of the responders believed Over-The-Counter drugs can be used. 50.0% participants have practiced of withdrawing medication when suspected side effects are seen while using Over-The-Counter. 77.42% participants have practiced self-medication and 88.71% of the participants have consulted physician when Over-The-Counter medication does not relieve the ailment. 41.9% of the participants have suggested Over-The-Counter drugs based on similar symptoms with proper medication history. From our study, it was concluded that, most of the participant were aware about Over-the-Counter medication and it can further improve the rational use of Over-The-Counter drugs by conducting continuous educational awareness program for health care professionals and general public.

Keywords: Over-the-counter, knowledge, attitude, practice, pharmacist, self-medication

Introduction

According to the World Health Organization, self-medication is "the administration of medications to address conditions or symptoms that an individual has identified in themselves, or the ongoing or occasional use of prescribed medications for persistent or recurring illnesses or symptoms" [1]. It is the process by which people choose and utilize medications to treat self-identified diseases or symptoms without seeking advice from medical specialists [2].

Over-the-counter (OTC) drugs are also known as "non-prescription drugs" because they are medications that are sold without a prescription [3-5]. Literate people in India were found to be 76% more likely than illiterate people to self-medicate. Self-medication is a general practice around the globe and as a part of self-care it is performed regularly [5].

Vitamins, tonics, iron preparations, analgesics, cough mixtures, skin care products, sore throat treatments, antipyretics, laxatives, and nonsteroidal anti-inflammatory medicines (NSAIDs) are all included in the class of Over-The-Counter medications. People in India rely on self-medication, which is recommended by friends, family, and pharmacists due to the country's low socio-economic standing and the high cost of medical care. Since OTC medications lack regulation in India, studies indicates that approximately 76% of the population frequently takes prescription-free medications [3].

It can be hazardous to consume medication in the wrong way. Although there is increasing evidence that drug adverse reactions are common, they are frequently preventable.

These may result in health issues or even decease. Problems may arise from inadequate knowledge or inaccurate information on Over-The-Counter medications. This might involve consuming the drug in excess or not as directed, both of which can be unsafe. Numerous studies have identified a number of risks related to inappropriate self-medication, such as: adverse drug reactions; improper medication administration; failure to receive a potentially serious diagnosis; dependence on the drug; adverse interactions with food, other medications, or pre-existing medical conditions; overuse of the drug; and possible toxicity [1].

A lack of public awareness and easy availability to a variety of antibiotics, painkillers and anti-inflammatory pharmaceuticals can cause individuals in India to be ignorant of the potentially dangerous side effects of some of these drugs. People in India may turn to alternative remedies for their health issues, frequently avoiding doctors, due to a lack of access to high-quality primary healthcare and the high expense of medical care. India does not have a legal classification for "OTC" pharmaceuticals, compared to many other countries [1].

OTC drugs have the potential to be abused and misused, which is considered unethical and clinically inappropriate. Overuse, taking many medications at once, and using home remedies to treat possibly hazardous illnesses are examples of consumer misuse of over-the-counter medications [6].

Good Pharmacy Practice (GPP) guidelines were created by the Indian Pharmaceutical Association (IPA) and the International Pharmaceutical Federation (FIP). The duties and obligations of pharmacists are governed by these policies and procedures. Pharmacists have to be able to counsel patients on how to choose and take Over-The-Counter drugs and other antibiotics. However, community pharmacists do not always implement those regulations [4].

Pharmacists and Physicians are essential in offering practical guidance on how to deal with pharmaceutical items safely and ethically [7]. Medical, Pharmacy, and Nursing students must comprehend self-medication because of their future careers in healthcare. This will enable them to adequately counsel their patients on the possible consequences of using drugs for self-treatment. Based on many studies, Nursing, Pharmacy, and Medical students know plenty about illnesses and treatment, unlike the general public [1].

Hence, this study was conducted to analyse the knowledge, attitude and practice of OTC medications of Diploma in Pharmacy students.

Materials and Methods

- **Study Design:** A cross-sectional study was carried out to evaluate the KAP amongst the Diploma in Pharmacy students of Kangleipak Medical and Nursing Institute towards over-the-counter medications.
- **Duration of the study:** The study was conducted from February, 2025 to April, 2025.
- **Inclusion and Exclusion criteria:** D. Pharm interned students and 2nd year were included. 1st year D. Pharm students and incomplete response of the study were excluded.
- **Development of Questionnaire:** The questionnaire towards KAP study on OTC medication was generated from literature and adapted from the previous research studies available. The survey form is divided in four (4) sections in which the first section contains the demographic details, second section contain 8 Knowledge-based questions, third section contain 6 Attitude-based questions, fourth section contain 11 Practice-based questions. The questionnaire consists of 26 close ended questions.
- **Statistical analysis:** Descriptive statistical methods were used and data was analysed using MS excel spreadsheet. All categorical variables were presented as numbers and percentages.

Results and Discussion

In this cross-sectional study, the given KAP questionnaire was answered by 80 students, out of which 62 Pharmacy student participants were answered completely. Among which 40 were 2nd year D. Pharmacy students and 22 were D. Pharm interned students.

Assessment of knowledge on OTC drugs

Knowledge about OTC drugs among the participants was assessed by eight (8) Knowledge questionnaire (Table 1).

In our study, it was found that most of the participants, 95.16% responded that the OTC drugs was used usually for treating disease like Minor Illness & Injuries, whereas the remaining participants responded for chronic illness. It was in aided by a study performed by Ruchi Shrestha *et al.*, where 92.9% of their participants had opted for minor illness [8].

96.77% of our participants had the knowledge that OTC drugs could be used after their expiry date which were in consistent with the study conducted by Divya Raj *et al.*, where 88.1% give the same response [1].

In our study, 82.26% participants responded that OTC drugs can cause side effects sometimes whereas 16.13% participants responded that it can cause side effects most of the time. In contrast with the study of Divya Raj *et al.*, where 14.1% participants responded that OTC drugs can caused side effects sometimes and 78.8% responded that it can caused side effects mostly [1].

74.19% of participants in our study responded that OTC drugs were safe and effective and 20.97% responded vice versa which was in contrast to the study of Ruchi Shrestha *et al.*, that 19.32**%** of their participants responded that OTC drugs were safe and effective and 66.1% responded that OTC drugs were not safe and effective [8].

In the current study, 82.26% participants responded that caution should be taken mostly during Pregnancy, 9.68% during Lactation, 1.6% in elder patients and 6.46% in children while using OTC drugs (Figure 1). Likewise in a study performed by Divya Raj *et al.*, 74.5%, 4.9%, 3.1% and 11.1% responded that caution should be taken mostly during Pregnancy, Lactation, in elder patients and in children respectively while using OTC drugs [1].

93.54% of participants agreed that OTC drugs could be purchased without a doctor's Prescription and 6.46% of participants disagreed which was observed in our study (Fig. 2). Similar observation was found in the study conducted by Bikash Meher *et al.*, 86% responded that OTC drugs could be purchased without a doctor's Prescription [9]. The higher percentage in our study might be because all the participants were Pharmacy students as they had good knowledge regarding medicines.

"Pharmacist can be recommended OTC drugs" was responded by 88.7% of our participants and 9.7% responded that Pharmacist could not recommend (Figure 3). Comparably in a study done by Fathi El-Gamal *et al.*, 80.2% responded that Pharmacist can be recommended OTC drugs [10]. As many people were unable or unwilling to visit the physician due to various reasons, they directly visited and enquired the community pharmacist.

OTC drugs contents smaller quantities, unsafe for use without medical supervision and OTC drugs could be toxic as compared to prescription drugs were responded by 24.2%, 72.6% and 3.2% of our participants respectively. Veneta Lusk's study mentioned that prescription medications had a higher potency than OTC drugs and also stated that prescription drugs were unsafe for use without medical supervision [11].

Assessment of Attitude on OTC drugs

Attitude about OTC drugs among the participants was assessed by six (6) Attitude questionnaires (Table 2).

In our study, majority of the participants felt that sharing OTC drug was not safe with others (Figure 4). A different response was found in the study of Divya Raj *et al*., 27.3% felt that sharing was not safe [1]. 82.25% participants felt that OTC drugs were easily available and cheaper.

Contrarily, Divya Raj *et al*., found that 47.2% of their participants responded that OTC drugs were cheap and easily available and 6.8% responded that these drugs were not easily available and cheaper [1].

75.81% respondents concluded that OTC drugs were affected by various storage conditions like direct sunlight, moisture, temperature etc. Contradict result was found in the study of Divya Raj *et al*., that 85.1% respondents disagreed the above query [1].

In current study, 80.6% of respondents concluded that OTC drugs were appropriate to treat minor-ailments like diarrhoea, headache, common cold etc. (Figure 5) which was less responded in a study conducted by Bekele *et al*., 50.5% respondents thought that OTC drugs were appropriate to treat minor-ailments [2].

In our study, 74.2% of participants responded that OTC drugs could alter the action of another drug administering together and 8.1% responded that OTC drugs could not alter the action of another drug administering together. Similar results also observed in study of Divya Raj *et al*. [1].

Out of 62 participants, 88.7% of participants responded that Pharmacist's advice was required when someone had never used OTC medicines and 3.2% responded that Pharmacist's advice was not required (Figure 6). Comparable responses were observed by Bekele *et al*. [2].

Assessment of practice about OTC drugs

Practice about OTC drugs among the participants was assessed by eleven (11) Practice questionnaires (Table 3).

50% participants responded that immediate stop OTC medication if any suspected side effects were seen and 46.78% participants responded, to consult a Physician (Figure 7). Identical observations were found in the study of Divya Raj *et al.* [1].

64.51% respondents responded that OTC drugs were consumed in minor symptoms, 12.9% when felt sick and 22.6% while unable to visit Physician. Comparable responses were observed by Ruchi Shrestha *et al.* [8].

In present study, OTC drugs were used while Headache, Dyspepsia, Body pain, Cold cough and Dysmenorrhea by 62.9%, 8.1%, 8.1%, 19.3% and 1.6% participants respectively. In a study of Divya Raj *et al.* Similar responses were given by their respondents [1].

In the current study, mostly OTC medicines were stored in Medicine Box, while in a study of Bekele *et al*., concluded that OTC medicines were stored in Medicine Box and Open table/ bedroom [2].

Maximum respondents checked the expiry date before using OTC drugs in present study whereas, only 70% responded in the study done by Aditya Goyal [12].

In our study, 77.42% participants had done self-medication of OTC drugs (Figure 8) which was comparable to the study done by F Susheela *et al*., where 80.6% participants were responded that self-medication of OTC drugs was done [13].

4.84% of our participants responded that OTC medicines were changed to more powerful OTC drug if it did not work on their symptoms, 6.45% waited for symptom to subside whereas 88.71% respondents consulted a Physician (Figure 9). However, in a study done by Annu Merin Varghese, *et al*., only 51.2% respondent consulted a pharmacist or Physician and 28.2% respondent changed to more powerful OTC drug [14].

In our present study, 6.45%, 16.13% and 70.97% participants were used kitchen tablespoon, teaspoon and dosing device respectively to measure the dose of liquid dosage form for children. Similar study was conducted by Abarna Nadeshkumar *et al*., where 65.9% respondents were used dosing device to measure the above dose [15].

69.35% participants had practiced in suggesting OTC medicines to others which is slightly higher than the finding of the study by Kavya HG, *et al*. where, 41.8% respondents had suggested it to others [16].

In our study, OTC medicines were suggested to others based on similar symptoms, similar symptoms with proper medication history and by examining the illness by 11.3%, 41.9% and 24.2% participants respectively (Fig.10) whereas 22.6% participants had never suggested OTC medicines to others. In an educational review on OTC drugs by Ravinandan AP, *et al*., OTC drugs were suggested for others with similar symptoms or ailments [17].

90.3% of our participants were responded that if any changes in physical appearance of OTC drugs, they were immediately discarded the medicine whereas in the study done by Goyal A *et al.*, only 61% were responded the same response [12].

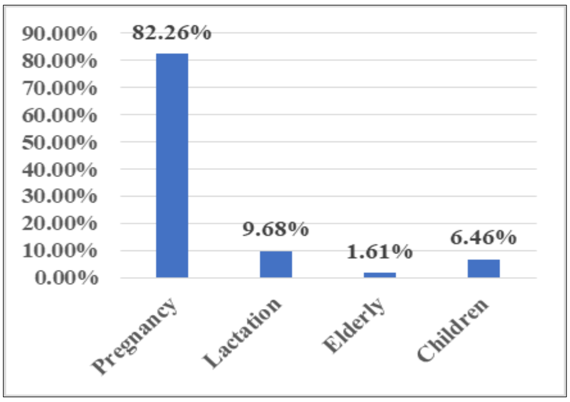

Fig 1: Caution should be taken mostly during while using OTC drugs

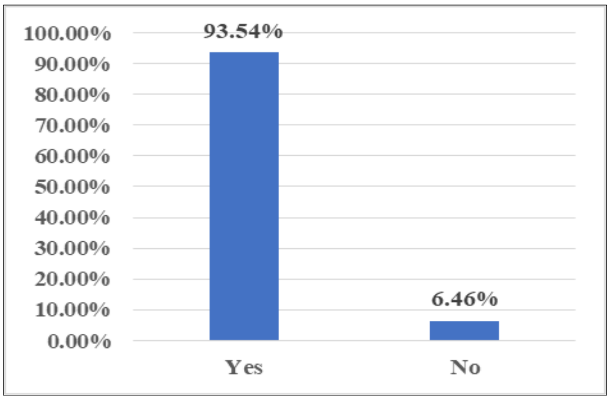

Fig 2: Can OTC drugs purchase without a doctor's Prescription?

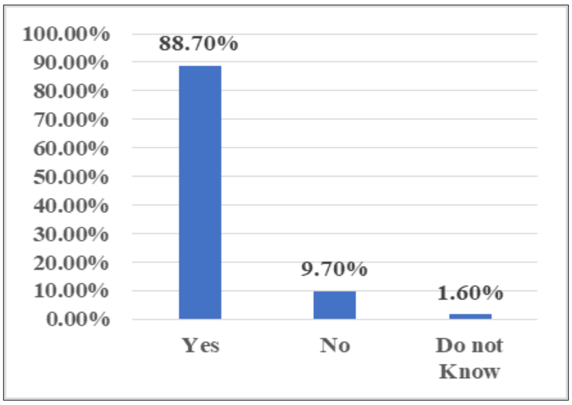

Fig 3: Can OTC drugs be recommended by the Pharmacist?

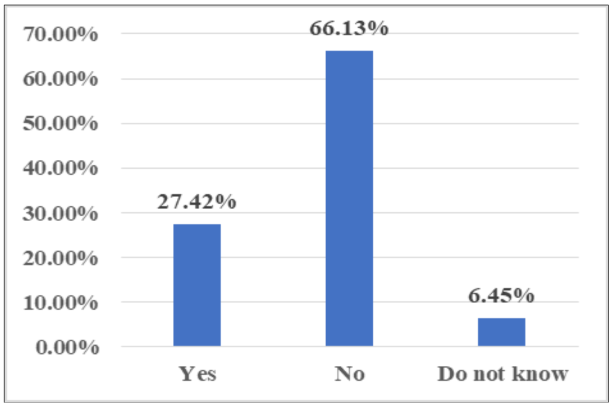

Fig 4: Sharing of OTC medication with others is safe?

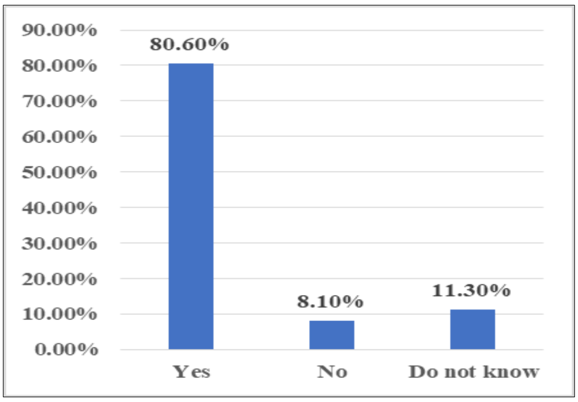

Fig 5: OTC drugs are appropriate to treat minor-ailments like Diarrhoea, headache, common cold etc.

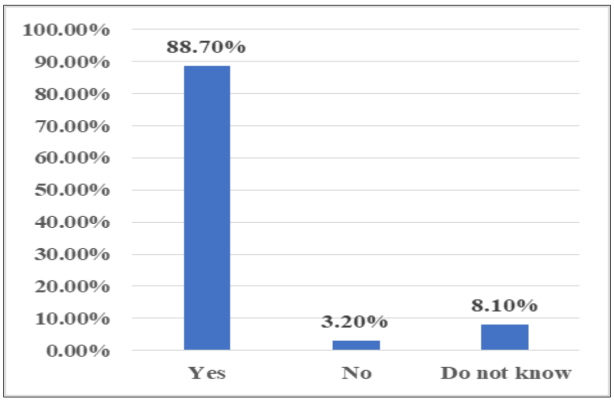

Fig 6: Pharmacist's advice is required when someone has OTC medicines that he/she has never used before

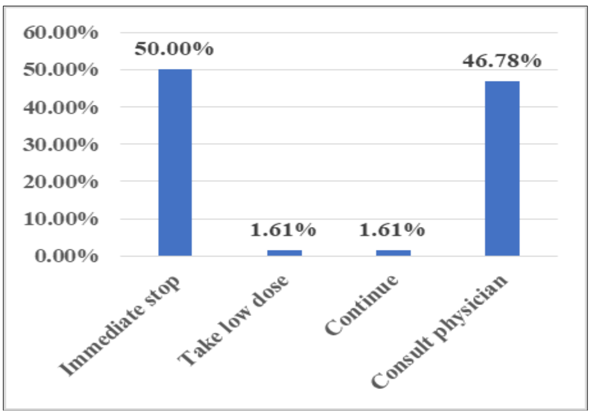

Fig 7: What you should do if suspected side effects are seen while OTC medication?

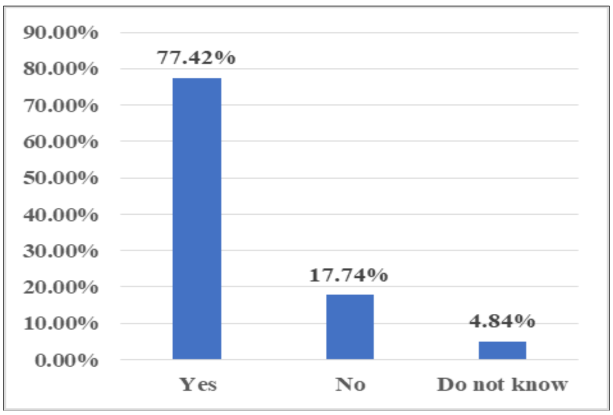

Fig 8: Do you practice self-medication of OTC drug?

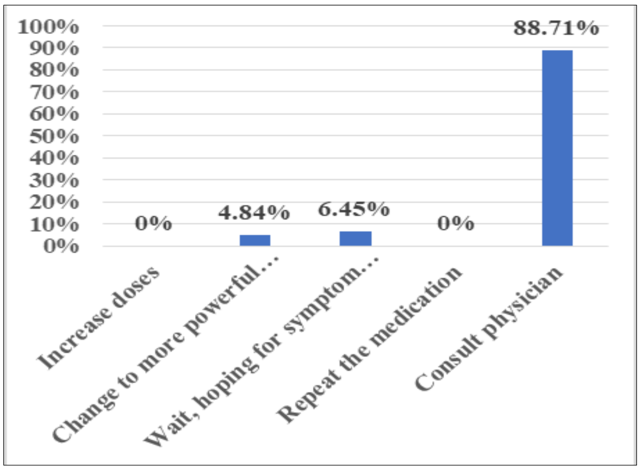

Fig 9: If an OTC drug does not work for your symptom?

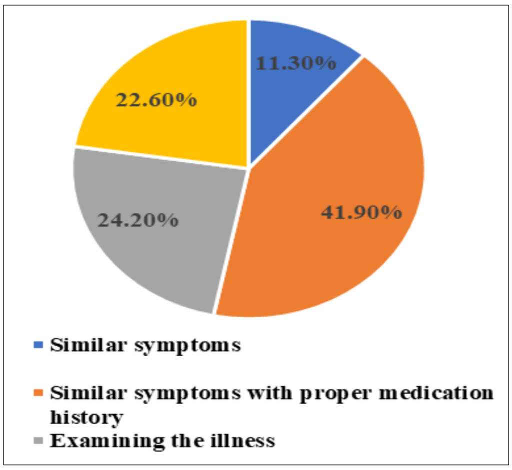

Fig 10: How do you suggest any OTC drugs for others based on?

Table 1: Knowledge based OTC drugs questionnaires

OTC drugs are usually for treating disease like	**Chronic illness**	**Minor illness & injuries**	**Do not know**	
Respond	3(4.84%)	59 (95.16%)	0	
OTC drugs could be used after their expiry date.	Yes	No	Do not know	
Respond	2 (3.23%)	60 (96.77%)	0	
OTC drugs can cause side effects	Sometimes	Mostly	Never	Do not know
Respond	51 (82.26%)	10 (16.13%)	0	1 (1.61%)
OTC drugs are safe and effective	Yes	No	Do not know	
Respond	46 (74.19%)	13 (20.97%)	3 (4.84%)	
How Prescription medicines are differed from OTC medicines?	OTC drug contains smaller quantities	Unsafe for use without medical supervision	OTC drugs can be toxic	Do not know
Respond	15 (24.2%)	45 (72.6%)	2 (3.2%)	0

Table 2: Attitude based OTC drugs questionnaires

OTC drugs are easily available and cheaper	**Yes**	**No**	**Do not know**
Respond	51 (82.25%)	7 (11.3%)	4 (6.45%)
OTC drugs are affected by storage conditions like direct sunlight, moisture, temperature etc.	Yes	No	Do not know
Respond	47 (75.81%)	12 (19.35%)	3 (4.84%)
OTC drugs can alter the action of another drug administering together.	Yes	No	Do not know
Respond	46 (74.2%)	5 (8.1%)	11 (17.7%)

Table 3: Practice based OTC drugs questionnaires

At which condition do you consume OTC drugs?	**Symptoms are minor**	**Feel sick**		**Unable to visit physician**	
Respond	40 (64.5%)	8 (12.9%)		14 (22.6%)	
For which illness do you usually use OTC drugs?	Headache fever	Dyspepsia	Cold cough	Body pain	Dysmenorrhea
Respond	39 (62.9%)	5 (8.1%)	12 (19.3%)	5 (8.1%)	1 (1.6%)
Where do you store OTC drugs?	Medicine box	Open table/ bedroom	Refrigerator	Kitchen	Bathroom
Respond	57 (91.95%)	1 (1.61%)	2 (3.22%)	0	2 (3.22%)
Do you check the expiry date of an OTC drug before using it?	Yes	No		Do not know	
Respond	58 (93.55%)	1 (1.61%)		3 (4.84%)	
Many OTC medicines for Children come in Liquid dosage form, what is the best way to measure the dose?	Use kitchen table spoon	Teaspoon		Special dosing device	Any of above
Respond	4 (6.45%)	10 (16.13%)		44 (70.97%)	4 (6.45%)
Do you suggest any OTC medicine to others?	Yes	No		Never	
Respond	43 (69.35%)	16 (25.81%)		3 (4.84%)	
If any changes in physical appearance of OTC drugs, what you should do?	Continue until expiring	Continue using if after expiring		Immediate discard the medicine	
Respond	1 (1.6%)	5 (8.1%)		56 (90.3%)	

Limitations
The limitation of the study is that the number of participants who were involved in this study was comparatively small as well as study period is short.

Conclusion
The practice of self-medication with over-the-counter drug is prevalent among pharmacy students. Various significant issues and malpractices have been observed, including the sharing of OTC medications, the utilization of expired drugs, the transition to stronger medications when initial treatments prove ineffective, various storage conditions are inappropriate and ignoring to check labels and expiry date.
Most students possess a good level of knowledge regarding OTC drugs and exhibit a positive attitude towards them. The practice of self-medication among students is an optimal response. The inability to consult a physician for minor ailments, combined with prior knowledge of medications, are the primary reasons for self-medication among the participants. It is essential to implement an awareness program aimed at enhancing their understanding of various aspects of OTC drugs, including the hazards associated with misuse, targeting both the general public and community pharmacists to promote the responsible use of medications.
From this study, it is concluded that escalating pharmacists' knowledge's, attitudes, and practices (KAP) concerning OTC drugs can guide to a more rational use of non-prescription medications.

Acknowledgements
We would like to express our sincere gratitude to all the participants for sparing their precious time to answer our questionnaire that helped us to successfully complete our study.

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