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RESEARCH ARTICLE

Knowledge, Attitude, and Practice on Over-the-Counter Drugs among Undergraduate Medical Students

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ABSTRACT

As a form of self-medication, Over-the-counter (OTC) drugs are commonly used by medical students. To use over-the-counter medications safely, students must have the adequate knowledge, attitude, and practice (KAP) about these medications and the associated adverse effects. The aim of this study was to assess the undergraduate medical students' knowledge, attitude and practice toward over the counter drugs. This was a cross-sectional study, and a self-administered questionnaire was used to collect the data. To determine the association between KAP and OTC use, Chi-square analysis and multivariable logistic regression analysis were done. The total students included in the study was 402. 8.35 was the mean knowledge score with minimal variation between gender and phase of study. Awareness of the implications of OTC drug expiry was high, with 82.1% rejecting the expired drugs use. The average score was 2.75 for attitude. 42.3% of respondents agreed over-the-counter medications are more affordable and handier, indicating a mixed attitude and 40% remained neutral. Sharing OTC medications was generally discouraged, with only 18.7% in favour and 32.3% disagreeing. A strong majority (67.4%) agreed that expert advice should be sought when using unfamiliar OTC medications. Practice scores differed significantly across student phases (p < 0.001) suggesting education positively influences safe OTC drug use. This study reflects good training and awareness of undergraduate medical students on OTC drugs. Some students were unsure about specific risks of OTC drug interactions and storage conditions, indicating areas for targeted educational interventions.

Keywords: Self-medication; Undergraduate medical students; Over-the-counter

INTRODUCTION

Medication that can be marketed directly to consumers without a prescription is known as over-the-counter (OTC). Prescription drugs are only administered to people who currently have a prescription. Adverse drug reactions and non-adherence to treatment regimens can be directly caused by inadequate understanding of over-the-counter drugs. There is evidence that people use over-the-counter medications for self-medication. Self-medication practice, according to the World Health Organization (WHO) is persons who choose and use drugs to treat symptoms or illnesses they have independently diagnosed without consulting a doctor [1,2]. One of the biggest public health issues in both developed and developing countries is self-medication and it is a crucial part of the self-health care system. OTC medications, leftover medications from prior prescriptions, and medications acquired from friends or family can all be used as self-medication [3,4]. Effective self-medication techniques can save the costs of community-funded health care systems, stop scarce medical resources from being wasted on unimportant ailments, and lower absent in work due to minor symptoms [5]. When it comes to advising customers on the safe and appropriate use of medications meant for self-medication, pharmacists can be extremely helpful. Conversely, self-medication risk includes misdiagnosing oneself, delaying seeking timely medical

advice, selecting the wrong course of treatment, failing to recognize rare serious side effects, omitting warnings and precautions, increasing polypharmacy, masking serious symptoms, and interacting with other commonly used drugs. Numerous studies conducted worldwide have documented how common self-medication is among medical personnel[6]. According to a cross-sectional survey, 76% of people at Aga Khan University in Karachi, Pakistan, self-medicate. Additionally, the survey found that the most widely utilized medications were analgesics (88.3%), antipyretics (65.1%), and antibiotics (35.2%)[7]. Studies carried out in Serbia and India also revealed similar results, with respective total prevalences of 79.9% and 78.6%[8,9]. A study carried out in Kuwait revealed a more significant result: 97.8% of people there acknowledged using self-medication. Approximately 20.79% of research participants stated that they infrequently or never check the expiry date of the OTC medications they took. This result was more than that of a related survey carried out in Asmara, Eritrea, where 7.5% of participants said they never looked at expiration dates[10,11]. This is concerning since failing to verify the expiration date of medications might result in a build-up of outdated pharmaceuticals in the home and numerous negative effects from the drugs. When asked what they would do if over-the-counter medications changed in shape, color, or odor, some respondents said they would keep using them until they expired (14.9%), and others said they would keep taking them even after the expiration date (3.3%), albeit the results were not statistically significant. Given the individuals' professional backgrounds, this is extremely concerning, who are expected to be role models to others and condemn these types of malpractices[12]. According to certain ongoing studies, many medications maintain 90% of their potency for at least five years after the indicated expiration date, and occasionally longer, if maintained under ideal conditions. However, the World Health Organization has advised against reusing unused or expired pharmaceuticals, and numerous other studies have documented the harmful effects of doing so. Expired drugs may be less effective or dangerous due to a change in their chemical makeup or a decline in their strength. Additionally, if a medicine is utilized past its expiration date, it may decay and produce compounds that are far more hazardous than the original active medicinal ingredient. There was also another risky behaviour among the respondents, as many of them stated that if their over-the-counter prescription didn't work, they would double the dosage. One of the most frequent causes of the numerous adverse drug reactions (ADRs) associated with drugs is taking more medication than is advised. Over-the-counter (OTC) pharmaceutical use has also been linked to these types of malpractices[13]. A considerable portion of the respondents (46.2%) reported keeping their drugs in a medicine box (cabinet), and a smaller percentage (0.7%) reported keeping their prescriptions in a lavatory. In addition to the risks of children accidentally becoming poisoned and other associated hazards of improper medication storage, bathrooms and medicine cabinets are not the best places to keep medications because of the heat and humidity, which can reduce their potency and shorten their shelf life[14].

Student abuse of over-the-counter medications has grown to be a significant issue. Young people are more exposed to the media, and the growing promotion of drugs presents a greater risk to this demographic. Few research has been conducted on medical students' self-medication. Because they are exposed to information regarding illnesses and medications, medical students may be different from the general population. Undergraduate medical students are included in this study to evaluate their knowledge, attitudes, and practices regarding over-the-counter medications.

MATERIALS & METHODS

After institutional human ethical committee approval, a cross - sectional study was done using google forms as a data collection tool and included questions under the following sections

Section A – Demographic data – Age, Gender, Qualification, Section B – Eight questions on knowledge about OTC drugs, Section C – Six questions on attitude about OTC drugs, Section D - Six questions on practice about OTC drugs. A total of 402 responses were collected after informed consent from undergraduate students of KMCH Institute of health sciences & research, Coimbatore. Description about the nature of study and willingness to participate was incorporated in the beginning of the questionnaire (Google form). Confidentiality of the participant details were maintained. Students who were not giving informed consent were excluded from the study.

Statistical analysis

SPSS software version 27 was used for data analysis. The data collected was analysed using simple mean and proportions. The maximum and minimum response for each question was analysed separately.

RESULTS

Among the total 402 participants majority were between 21 and 22 years of age (26.9% and 24.9% respectively). More than half (55.7%) of the respondents were female. A majority of participants understood the risks associated with OTC drugs, as reflected in the negative response to statements such as "All OTC drugs are safe and effective" (71.4% disagreed). Awareness of the implications of OTC drug expiry was high, with 82.1% rejecting the use of expired drugs. Students recognized that OTC drugs can cause side effects (63.7% said "Sometimes"), but there was some uncertainty regarding specific safety scenarios. Gender differences in knowledge were not statistically significant.

Differences across qualifications were marginal but not significant, with slightly higher knowledge levels among students in the final MBBS phase (Table 1).

Table 1: Knowledge of students towards self-medication of OTC dru gs

Knowledge questions	Yes	No	Don't know
All OTC Drugs are safe and effec-tive	16.4	71.4	12.2
OTC drugs are used usually for common diseases	74.9	14.9	10.2
OTC drugs could be used after their expiry date	8.5	82.1	9.5
All OTC drugs, when taken along with the prescribed drug, are safe	22.6	53.5	23.9

Data is expressed in percentage (%)

Regarding attitude, a mixed attitude was observed towards OTC drug convenience and safety. While 42.3% agreed that OTC drugs are cheaper and convenient, 40% remained neutral. Sharing OTC medications was generally discouraged, with only 18.7% in favour and 32.3% disagree-ing. A strong majority (67.4%) agreed that expert advice should be sought when using unfamiliar OTC medications. Attitudes were slightly more positive among students in higher qualification phases, but the difference was not statistically significant. Gender differences in attitudes were minimal and did not reach significance (Table 2).

Regarding Practice, Self-medication was common, with 73.9% reporting they had followed this practice. A significant portion (60.4%) consistently read instructions on OTC labels, and 90.8% checked expiry dates before use. Overdose of OTC medications was relatively rare (10.4%), but adverse drug reactions (ADRs) due to OTC drugs were reported by 9.2%. Students recognized the importance of special precautions during pregnancy (79.6%), reflecting an understanding of high-risk groups. If side effects were observed, most participants reported to a doctor (67.4%). Gender differences in practice were negligible, as seen in mean practice scores. Students with higher qualifications had significantly better practices related to OTC drug use ($p < 0.05$), with more cautious behaviours observed in advanced phases of education. Mean knowledge score was 8.35, with minimal variation between genders or qualifications (Table 3).

The average attitude score was 2.75, with no significant differences across demographic groups. Practice scores differed significantly across qualification phases ($p < 0.001$), suggesting education positively influences safe OTC drug use. Total scores did not show significant gender-based dif-ferences but were slightly higher for advanced qualification groups.
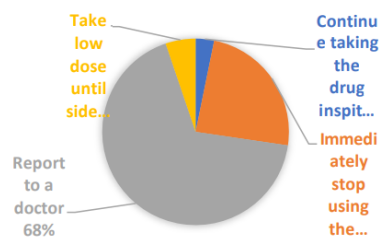

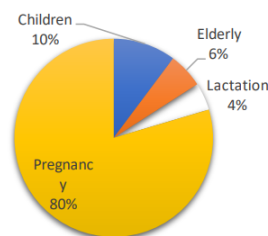**Fig. 1: Suspected side effects seen**
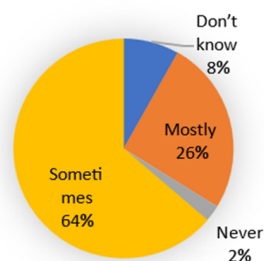

Fig. 2: Caution in OTC drug use

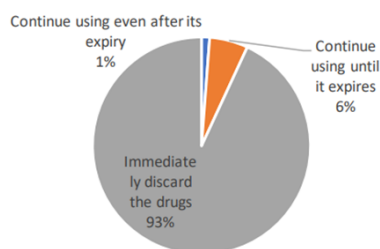**Fig. 3: OTC drugs can cause side effects**

Fig. 4: OTC drugs show a change in shape, colour, odour

Table 2: Attitude of students towards self-medication of OTC drugs

Attitude Questions	Percentage				
	Agree	Disagree	Neutral	Strongly agree	Strongly disagree
OTC drugs are cheaper and convenient.	42	8	40	6.7	3
It is okay to share OTC medications with others.	18.7	32.3	33.6	2.5	12.9
OTC drugs can modify or alter the action of another drug.	51	6.2	27.4	12.4	3
It is appropriate to seek expert advice when someone has OTC medicines that he/she has never used before.	42.3	7.7	21.6	25.4	3
OTC drugs are not affected by storage conditions, like temperature, moisture, and direct sunlight.	16.2	38.1	24.9	3.2	17.7
When someone went to a pharmacy for OTC medication, he/she should bring all medications he/she is currently taking.	40.3	14.2	27.1	14.2	4.2

Data is expressed in percentage (%)

Table 3: Practice of students towards self medication of OTC drugs

Practice Questions	Percentage	
	Yes	No
Have you ever followed self medication practice?	73.9	26.1
Do you read the instructions on the OTC drug labels before use?	60.4	39.6
Do you check the expiry date of the OTC medications?	90.8	9.2
Have you ever taken OTC medication overdose?	10.4	89.6
Have you ever experienced ADR due to OTC medication?	9.2	90.8
Do you have history of self - medication in the past two weeks?	28.4	71.6

Data is expressed in percentage (%)

DISCUSSION

Self-medication can be beneficial when used appropriately because it can reduce acute discomfort and treatment costs and medical visits. However, self-medication with prescription-only drugs, for instance, can be risky and have serious health consequences if done incorrectly[15]. Drug resistance to several antibiotics has also been associated with inappropriate and frequent use of drugs that may be available over-the-counter[16]. Additional harmful behaviors and associated effects associated with the frequent use of over-the-counter pharmaceuticals include improper dosage, drug duplication, drug interactions, treatment failure, concealing symptoms and health issues, and delaying the prescription of the appropriate therapy[17].In the current study, the average knowledge score was 8.53. This outcome was consistent with a study conducted in Nepal that found that more than half of the participants had a positive outlook and a solid grasp of self-medication. The findings of a study conducted in Saudi Arabia were also comparable[18]. The mean score was still inadequate even if it was higher than average. Since it is expected of medical students to be educated about pharmaceuticals, they have broadened their understanding of all aspects of medication use. Just 18.7% of respondents agreed that sharing over-the-counter medications was generally discouraged, while 32.3% disagreed. Medication sharing is a major contributor to a number of detrimental health outcomes, such as unreported adverse drug events, challenges with clinical diagnosis, drug resistance, and a delay in seeking therapy. Students in higher stages had slightly more favorable attitudes. This finding was consistent with a comparable study conducted in Jordan, which showed that senior students were more aware of the risks associated with self-medication than junior students[19,20]. This may be due to the fact that when students gain more years of education and get more acquainted with clinical practice and medicines, their opinions toward over-the-counter medications and SM practice will be directly influenced. 90.8% looked up expiration dates before to use, and a sizable percentage (60.4%) regularly read the directions on over-the-counter labeling. The fact that almost 10% of people neglected to check the expiration date is alarming since it could lead to an accumulation of out-of-date prescriptions in the home and a host of adverse drug reactions. Some respondents (5.7%) stated they would continue using over-the-counter medications until they

expired, and some (1.2%) indicated they would continue using them even after the expiration date if they altered in shape, color, or odor. This is particularly troubling because the study participants have professional qualifications and are expected to be role models for others, condemning such malpractices. Many pharmaceuticals retain 90% of their potency for at least five years after the declared expiration date, and often longer if stored under optimum conditions, according to certain ongoing studies[21,22]. However, reusing unused or expired medications has been discouraged by the World Health Organization, and many other studies have shown the negative consequences of doing so. Because of changes in their chemical composition or a decrease in their potency, expired medications may be less safe or effective. Furthermore, medications that are used after their expiration date may decompose and release substances that are significantly more dangerous than the original active ingredient[23,24]. There is a need for focused educational interventions since some students were unclear about the specific hazards of OTC drug interactions and storage conditions. Good training and awareness are demonstrated by the majority of students' safe practices, which include reading labels and verifying expiration dates. It is crucial to address misconceptions, such as the 16.4% of students who think that all over-the-counter medications are naturally safe[25]. Safe over-the-counter drug practices can be further enhanced by raising knowledge of ADR reporting and refraining from medicine sharing. Better practice results are correlated with higher educational phases, highlighting the significance of maintaining pharmacological safety as a key component of medical training.

CONCLUSION

This study highlights the need for structured interventions in medical curricula to ensure responsible OTC drug use among future healthcare providers. Promoting awareness about ADR reporting and avoiding medication sharing can further improve safe OTC drug practices. Higher educational phases correlate with better practice scores, underscoring the importance of continued emphasis on pharmacological safety during medical training.

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