Original Research Article

Patient Knowledge and Utilization of Over-the-Counter (OTC) Medications: A Comprehensive Study

ABSTRACT

Background: Over-the-Counter (OTC) medications are the drugs that do not require prescription. In earlier times, self-medication of OTC drugs was not considered a healthy practice. But now FDA stated that "when these medications are used according to guidelines, they are considered safe and effective". Although along with the potential benefits over-use and miss-use is considered harmful and can cause potential side effects.

Objective: The research is carried out with objective to assess patient knowledge regarding OTC medicines use pattern, potential side effects and interactions.

Methods: The research was conducted in different cities of Punjab,Pakistan. Data was collected on validated questionnaire after getting consent from patients. And SPSS version 26 was used forstatistical analysis of the collected data. Patients below 18years of age were excluded from the study.

Results:A total of 162 patients participated in the current study. A statistically non-significant association was observed between the participants' gender and their level of knowledge regarding OTC medication, with a p-value of 0.442. However, a statistically significant association was found between having healthcare providers among family members and knowledge about OTC medication, with a p-value of 0.015 and an effect size of 0.008, indicating a weak positive association. Additionally, geographical location demonstrated a direct positive effect, with a p-value of 0.001 and an effect size of 0.330, which reflects a moderate positive association according to Cohen's classification.

Conclusion: Gender does not affect overall knowledge of OTC medications; however, education has a direct impact on understanding and using medications. Among the sources of

information regarding OTC medications, healthcare providers within family members are identified as the most significant source.

Keywords:

Over-the-Counter (OTC), Patient Knowledge, Usage pattern of Over-the-Counter Medications, Side effects of OTC.

INTRODUCTION:

Medications that do not require a physician's prescription are known as over-the-counter (OTC) medicines (Yia-Rautio et al,.2020). Examples include painkillers such as: aspirin, paracetamol, and some anti-allergic i.e., loratadine. These are also referred to as non-prescription medicines (Marathe et al,. 2020). According to the FDA, OTC medicines are safe and effective for use when used according to the product label instructions and the directions of a healthcare provider (Munesh at al,. 2020).

Over-the-counter (OTC) medications are considered effective and often the first choice for treating minor health issues. The practice of self-medication with OTC medicines is sometimes referred to as "responsible self-medication" (May et al., 2023). Knowledge plays a crucial role in disease management and the cost-effectiveness of treatment when purchasing and using these medications without consulting a healthcare provider (May et al., 2023). These medications are perceived by patients to be readily available, safe, and effective for use without professional consultation (Ilardo et al., 2024). Individuals can obtain OTC medicines from pharmacies, grocery stores, and even supermarkets (Ilardo et al., 2024).

The concept of responsible self-medication has a long global history. However, in the 1960s, self-medication was often viewed as unnecessary and unhealthy. Today, some countries actively promote and encourage these practices at the national level (Blum et al., 2022). Reports indicate that 50-70% of the population in developed countries have used over-the-counter (OTC) medications (Shahid S et al., 2022). The marketing and market share of OTC medications play a significant role in this trend. According to published data, OTC medications account for 30% of the market in Poland, compared to 10-20% in other European countries (Sánchez-Sánchez et al., 2021).

In the UK, an estimated 13% of consultations for minor illnesses occur in general practice, while 5% take place in Accident & Emergency (A&E) departments (Smith et al., 2021). OTC medications commonly used include anti-allergic, antipyretic, and analgesic drugs, with NSAIDs being the most frequently utilized class (Shahid et al., 2024). A study in Germany shows a significant portion of the population regularly uses NSAIDs and other analgesic drugs (Müller et al., 2024). The availability of non-steroidal anti-inflammatory drugs as OTC medications has led to an increase in their consumption over the past 20 years (Regi et al., 2024).

When considering patient awareness and sources of information about OTC medications, several key sources are often cited. These include medications previously prescribed to the patient for the same condition, recommendations from family members or friends who have used these medicines, and information gathered from books or the internet (Martin et al., 2022).

All these factors depend on patients' knowledge of medications. Various reasons for using OTC medicines include the desire for quick relief from conditions such as headaches, abdominal cramps, and fever (Smith et al., 2024). These medical conditions typically do not require direct supervision from a healthcare provider (Jones et al., 2021). And here are some benefits and advantages of OTC medications: cost effective treatment, reduction in time as there is no or less need of consultation. It promotes self-treatment and lower the burden on both the patient and health care system, these are conveniently available medications (Morsy et al., 2021).

Despite the benefits of OTC medicines, several issues arise due to low literacy rates, poor awareness of their proper use, and irrational use of medications. These issues include antibiotic resistance, polypharmacy, drug interactions, and potential side effects(Mirdad et al. 2023),when someone lack adequate knowledge it may result in over use, drug abuseand non-compliance to the medication(Bekele et al. 2020),the readily availability of these medicines has increased the incidents of disease related morbidity especially in patient with pre-existing chronic disease(Mullan et al. 2017). This can lead to missed opportunities, such as identifying medical conditions caused by dietary habits or other aspects of daily life that could be improved through lifestyle changes. Without consulting a healthcare provider, these conditions may go undiagnosed, potentially worsening over time. This could result in more serious health issues and higher treatment costs in the future(Patel et al. 2020).

The objective of this research is to evaluate patient knowledge on the correct use of over-the-counter (OTC) medications, as well as their understanding of the potential side effects and interactions associated with commonly used OTC medications.

METHODOLOGY:

The study was conducted by students from a private medical institute in Lahore to assess patients' knowledge of OTC medications. A validated questionnaire was used to evaluate patients' understanding. Data collection occurred from July 10, 2024, to July 25, 2024. A total of 222 questionnaires were collected, but 60 were incomplete and subsequently rejected.

Data was gathered from various regions of Punjab, Pakistan. The questionnaire was distributed to patients who consented to participate, and a pharmacist supervised all data collection. The questionnaire included multiple sections, beginning with a consent form outlining the study's objective, introduction, procedure, and confidentiality.

The questionnaire consisted of 40 questions divided into different sections. The first section collected demographic data, including age, gender, healthcare providers in the family, religious beliefs about medication use, access to healthcare providers, location, education level, marital status, and employment status. The second section assessed patients' knowledge of commonly used OTC medicines and included a series of questions with correct answers. A 60 percent right answers for the asked questions were considered as adequate knowledge of patients about OTC medication.

The third section contained eight questions to evaluate how, when, and why patients use OTC medicines, as well as questions regarding their OTC use habits. The fourth section aimed to understand any side effects observed by patients after using OTC medicines. The fifth section used yes/no questions to assess patients' knowledge about drug interactions after using any OTC drug.

INCLUSION CRITERIA:

The study included all those patients who came to the pharmacy to buy OTC medication & wanted to participate. The questionnaire was given to those willing patients to fill out.

EXCLUSION CRITERIA:

All the patients who are less than 18 years of age are excluded from the study.

STATISTICAL ANALYSIS:

To analyze the collected data, we used the 26th version of SPSS. Standard deviation (SD) and mean were employed to summarize the data. To determine if the data followed a normal distribution, kurtosis and skewness tests were applied. The null hypothesis was tested using independent t-tests or One-way ANOVA tests. Categorical data were evaluated using either Fisher’s exact test or the chi-square test. Effect size was measured using Cramer’s V or Phi (φ). A P-value of less than 0.05 was considered significant.

RESULTS

A total of 162 patients participated in the current study. Female participants comprised 23.5% of the total, which was lower compared to the percentage of male participants. Additionally, 38.9% of the patients had chronic conditions. The majority of participants (35.2%) were employed full-time. Further demographic details of the respondents are provided in Table 1.

Table 1: Demographic information of the patients. (N=162)

Age	
Age	31.21 ±12.59
Gender	
Male	124 (76.5)
Female	38 (23.5)
Is there any health care provider in your family?	
Yes	84 (51.9)
No	78 (48.1)
Any religious belief on medication use?	
Yes	87 (53.7)
No	75 (46.3)
Access to Healthcare provider:	
Regular access	106 (65.4)
Limited access	56 (34.6)
Any chronic condition (e.g. diabetes, hypertension etc.)	
Yes	63 (38.9)
No	99 (61.1)
Geographical Location:	
Urban	86 (53.1)
Sub-urban	28 (17.3)
Rural	48 (29.6)
Education Level:	
No formal education	12 (7.4)
Primary education	26 (16)
Secondary education	38 (23.5)
Technical Training	13 (8)

College Degree	33 (20.4)
Post-graduation	40 (24.7)
Marital/Family Status:	
Single	80 (49.4)
Married	57 (35.2)
Divorced	9 (5.6)
Widowed	2 (1.2)
With children	11 (6.8)
Without children	3 (1.9)
Employment Status:	
Employed full time	57 (35.2)
Employed part time	18 (11.1)
Unemployed	23 (14.2)
Retired	11 (6.8)
Student	40 (24.7)
Home-maker	13 (8)

A post-hoc pairwise comparison of chi-squared tests for various variables with patient knowledge among 162 patients was conducted to assess their levels of knowledge. The analysis revealed that 36.3% of males had adequate knowledge, which was higher compared to females. Patients with access to healthcare providers had significantly better knowledge (p-value = 0.015, effect size = 0.008) compared to those without such access. Further detailed information on participants' knowledge about OTC medications is provided in Table 2.

Table 2: Knowledge of participants

Variables	**Patient knowledge (N %)**			
	Adequate knowledge	**Inadequate knowledge**	***P*-value***	**Effect size#**
Gender				
Male	45 (36.3)	79 (63.7)	0.442	-
Female	11 (28.9)	27 (71.1)		
Is there any Health care provider in your family?				
Yes	30 (35.7)	54 (64.3)	0.869	-
No	26 (33.3)	52 (66.7)		

Any kind of religious belief on medication use:				
Yes	39 (44.8)	48 (55.2)	0.005	0.002
No	17 (22.7)	58 (77.3)		
Access to Healthcare provider:				
Regular access	44 (41.5)	62 (58.5)	0.015	0.008
Limited access	12 (21.4)	44 (78.6)		
Any chronic condition (e.g. diabetes, hypertension etc.)				
Yes	21 (33.3)	42 (66.7)	0.866	-
No	35 (35.4)	64 (64.6)		
Geographical Location:				
Urban	39 (45.3)	47 (54.7)	<0.001	0.330
Sub-urban	12 (42.9)	16 (57.1)		
Rural	5 (10.4)	43 (89.6)		
Education Level:				
No formal education	5 (41.7)	7 (58.3)	0.05	0.261
Primary education	4 (15.4)	22 (84.6)		
Secondary education	18 (47.4)	20 (52.6)		
Technical training	7 (53.8)	6 (46.2)		
College degree	12 (36.4)	21 (63.6)		
Post-graduation	10 (25)	30 (75)		
Marital /Family Status:				
Single	30 (37.5)	50 (62.5)	0.259	-
Married	22 (38.60)	35 (61.4)		
Divorced	3 (33.3)	6 (66.7)		
Widowed	0 (0.0)	2 (100)		
With children	1 (9.1)	10 (90.9)		
Without children	0 (0.0)	3 (100)		
Employment Status:				
Employed full time	26 (45.6)	31 (54.4)	0.117	-
Employed part time	6 (33.3)	12 (66.7)		
Unemployed	7 (30.4)	16 (69.6)		
Retired	1 (9.1)	10 (90.9)		
Student	10 (25)	30 (75)		

Home-maker	6 (46.2)	7 (53.8)		

The p-value was calculated using the chi-square test, as the data were non-parametric. The effect size was determined using the Phi coefficient, which measures the strength of association between categorical variables.

All the information regarding patient OTC use patterns, potential side effects, and interactions was also examined. Only 34% of patients were found to habitually use OTC medications. A larger number of patients were aware that long-term use of OTC medications could cause severe side effects. Further details on patient OTC use patterns, potential side effects, and interactions are provided in Table 3.

TABLE 3: Represents information regarding patient OTC use pattern, potential side effects and interactions.

Have you ever used two or more OTC medicines at a time?	
Yes	88 (54.3)
No	74 (45.7)
Do you think after continuously using an OTC medicine it becomes Less Effective?	
Yes	105 (64.8)
No	57 (35.2)
Are you habitual to use of OTC medicines?	
Yes	55 (34)
No	107 (66)
Have you ever increased the dose on your own when symptoms are not relieved?	
Yes	74 (45.7)
No	88 (54.3)
Do you think OTC medicines are the first option for minor health issues?	
Yes	125 (77.2)
No	37 (22.8)
Do you think OTC medicines have few side effects than prescription medicines?	
Yes	107 (66)

No	55 (34)
Have you ever felt sleepy after taking anti-allergic medicines?	
Yes	96 (59.3)
No	66 (40.7)
Do you think chronic use of OTC medicines can cause severe side effects?	
Yes	115 (71)
No	47 (29)
Did you know that OTC medicines can cause interactions with other medications and supplements	
Yes	104 (64.2)
No	58 (35.8)
Have you ever consulted any Health care provider regarding Interactions	
Yes	68 (42)
No	94 (58)
Any previous experience regarding medicines interaction?	
Yes	70 (43.2)
No	92 (56.8)
Do you think its important to report any interaction to health care provider	
Yes	127 (78.4)
No	35 (21.6)
Do you think you need more information to prevent interactions?	
Yes	125 (77.2)
No	37 (22.8)

Figure 1 shows opinions with sources of information on OTC medicines from all the respondents. In all the categories the health care providers are the richest source of information to all the participants. However, Books are the minimum source of information for all the participants. More details about all the confounders can be obtained from Figure 1 below.

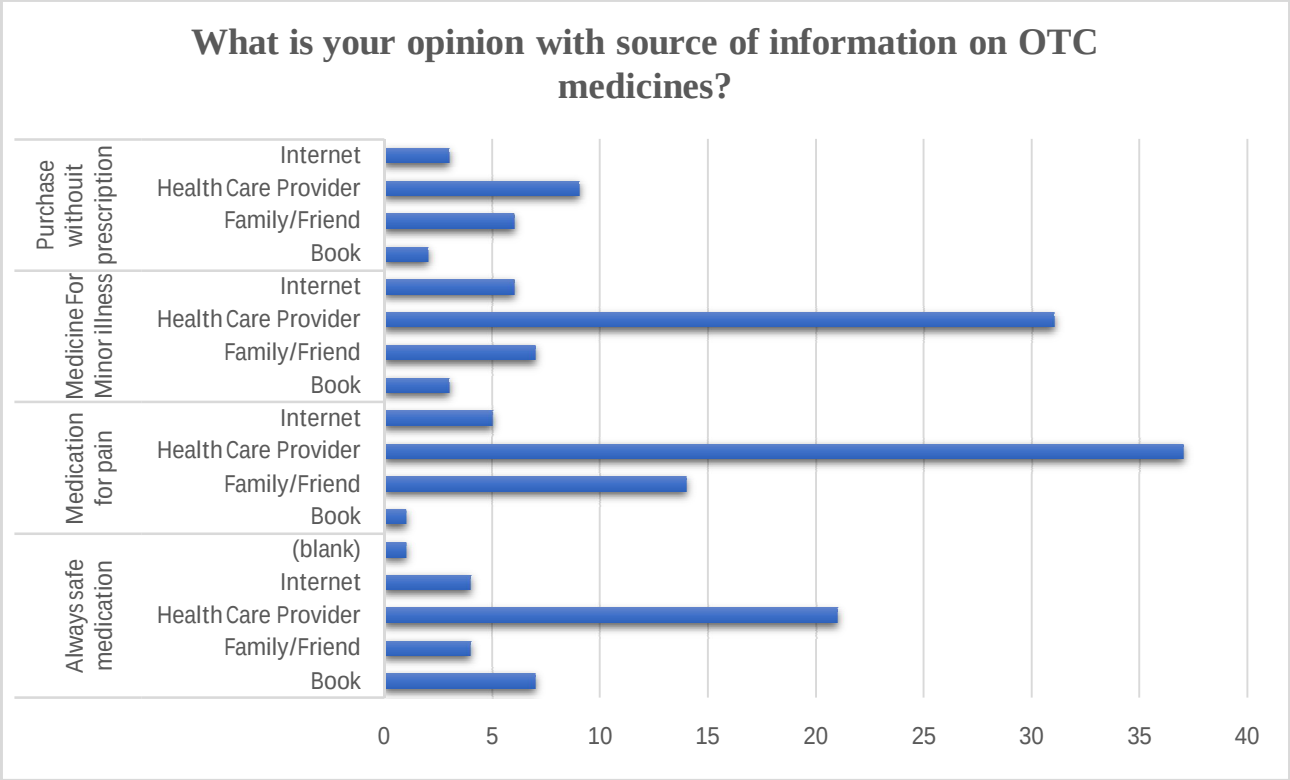

Figure 1: Opinions with sources of information on OTC medicines

DISCUSSION:

This study is pioneering in its assessment of patient awareness regarding the use of OTC medicines in any region of Punjab, Pakistan. No previous research in Pakistan has evaluated the awareness of OTC medicine use among patients with coronary disease. The study involved a total of 162 patients, with fewer females participating compared to males. This gender disparity likely reflects the higher male population in various areas of Punjab, as reported by the Abbas et al in Pakistan (Abbas et al., 2021). Furthermore, inadequate knowledge of females was more as compared to the males and the percentage was 71.1% get the P value of clear 0.442.

A statistically non significant association was reported with the presence of healthcare providers in a family with the P value of 0.869. Which proves that the presence of health care providers does not have any effect on better knowledge of respondents regarding the OTC medications and their uses the grand findings of this study are quite different from the others studies which was

conducted in 2021 by Iqbal et al according to which the presence of healthcare providers can significantly improve the knowledge of patients regarding the disease (Iqbal et al., 2021).

The present study shows that religious beliefs have a statistically significant impact (P value 0.005) on the use of OTC medications and the level of knowledge about these medications among our patients. Those with strong religious beliefs demonstrated better understanding of the proper use of OTC medications compared to others. This may be due to the emphasis on appropriate medication use within their religious teachings. Additionally, religious beliefs are often linked to educational background, highlighting the importance of accurate information when using OTC medications. The present study is well supported with a previous study conducted in Malaysia which proves the similar kind of findings (JINNAH et al., 2021).

The study also indicates that the presence of chronic diseases such as hypertension or diabetes mellitus does not have a statistically significant effect on the use of OTC medications or the knowledge regarding these medications. This suggests that whether or not patients have these chronic conditions, their use of and knowledge about OTC medications remain unaffected. The findings of the current study are supported by a study conducted in Saudi Arabia in 2022, which reported similar results regarding the use of OTC medications and chronic disease management (Alosaimi et al., 2022).

Similarly, the study indicates a statistically significant effect of patient education on the use and knowledge of OTC medications among all respondents. This suggests that higher levels of education are associated with better knowledge and more appropriate use of OTC medications. These findings are consistent with various studies conducted in different countries, which show that increased patient knowledge about both OTC and prescription medications leads to a better understanding and more effective use of these treatments (Huang et al., 2022: Shahet al., 2022: Rahmanet al., 2020).

Conclusion:

Over the counter drugs are the drugs that do not need prescription for dispensing. The current study evaluated the knowledge and use of OTC drugs among patients. Gender does not affect overall knowledge of OTC medications; however, education has a direct impact on understanding and utilization of OTC medications. Patients having healthcare provider in the family presented better knowledge and utilization practices. Level of education as well as area of

residence (urban area residents)positively impacted the knowledge and utilization of OTC drugs. Majority of the patients presented that healthcare providers in the family were the source of knowledge for them regarding OTC medications.

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