

# Self-medication in Central Saudi Arabia

## Community pharmacy consumers' perspectives

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### ABSTRACT

**الأهداف:** تهدف هذه الدراسة إلى تحديد مدى انتشار التداوى الذاتية وتقويم المعارف والسلوكيات والأدراك لدى المستهلكين نحو التداوى الذاتية.

**الطريقة:** أجريت هذه الدراسة المقطعية لمدة أربعة أسابيع في شهر مايو 2011م في مدينة الرياض، بالمملكة العربية السعودية وتم اختيار عدد من صيدليات المجتمع من شمال وجنوب وغرب وشرق ووسط الرياض بطريقة عشوائية لغرض الدراسة وشملت الدراسة كل المستهلكين باستثناء الذين حضروا لشراء المعدات الطبية ومستحضرات التجميل وتم استخدام استبيان ذاتي كما تم التحقق من صحة الاستبيان.

**النتائج:** وافق على المشاركة في الدراسة 538 مستهلك من أصل 707 زاروا صيدليات المجتمع في مدينة الرياض. وكان غالبية المستجيبين من الذكور (73%)، وتتراوح أعمارهم بين 23-33 سنة (35%) ومعظم المشاركين (42%) كانوا من خريجي الجامعات. وقد تم شراء ما مجموعه 285 دواء دون وصفة طبية منها 149 (49%) يجب أن تصرف بوصفة طبية فقط و 155 (51%) يمكن أن تصرف بدون وصفة طبية. وكانت المضادات الحيوية (22%)، والمسكنات وخافضات الحرارة (19%) من الأدوية الأكثر شيوعاً والتي يجب صرفها بوصفة طبية وكانت الأسباب الأكثر شيوعاً لشراء الأدوية دون وصفة طبية أن الأعراض كانت طفيفة جداً ولا تستدعي زيارة الطبيب (54%) وتوفير الوقت (40%) والأمراض البسيطة التي يعتقد المشاركون معرفتهم بالعلاج المطلوب (40%). بشكل عام وجد أن غالبية المشاركين يفتقرون للمعرفة ولديهم تصورات سلبية عن التداوى الذاتية. أكثر من 68% من المشاركين لا يعرفون ما إذا كان الدواء الذي اشتروه هو من الأدوية الوصفية أو من الأدوية الغير وصفية.

**الخاتمة:** ممارسة التداوى الذاتية دون مسؤولية شائع في المملكة العربية السعودية وينبغي أن تركز الدراسات المستقبلية على تحسين وعي المستهلكين حول التداوى الذاتية والاستخدام السليم للأدوية.

**Objectives:** To determine the prevalence of self-medication and assess the knowledge, attitudes, and perception of consumers toward self-medication.

**Methods:** This cross-sectional survey was conducted over 4 weeks in May 2011 in Riyadh city, Kingdom of Saudi

Arabia. Community pharmacies within 5 areas of the city (North, South, West, East, and Middle) were randomly selected for the study. All consumers were approached to participate in the study, with the exception of those buying cosmetic and medicinal equipments. A validated self-administered questionnaire was used to collect the data.

**Results:** A total of 538 out of 707 consumers attending community pharmacies in Riyadh city, agreed to participate in the study. Most responders were male (73%), 23-33 years old (35%), and college graduates (42%). A total of 285 medications were bought without a prescription. Of these, 149 (49%) medications should be dispensed by prescription only, and 155 (51%) were over the counter medications. The most common prescription medications dispensed without prescriptions were antibiotics (22%) and analgesics/antipyretics (19%). The most common reasons for buying medications without a prescription were that the symptoms were too minor to visit a doctor (54%), time saving (40%), and minor illnesses for which the participants knew the required treatment (40%). Overall, most participants had poor knowledge, and negative perceptions regarding self-medication. More than 68% of participants did not know whether the medicine they bought is a prescription-only or over the counter medication.

**Conclusion:** Irresponsible self-medication is common in Saudi Arabia. Future studies should focus on improving the consumers' awareness of self-medication and the proper use of medications.

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Many individuals practice self-care to maintain good health and to manage minor illnesses. The World Health Organization (WHO) has defined self-medication as 'the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms'.<sup>1</sup> The US Food and Drug Authority has defined Over the Counter (OTC) medication as "drugs that are safe and effective for use by the general public without seeking treatment by a health professional".<sup>2</sup> Self-medication with OTC medications is called responsible self-medication, and is an acceptable practice worldwide, whereas buying prescription medications without a prescription from a physician is dangerous and considered as unsafe self-medication.<sup>1</sup> The benefits of using OTC medications include a reduction in the frequency of visits to a physician and reduced cost.<sup>3</sup> However, misuse of OTC medications can be accompanied by adverse reactions, interactions with other medications, overdosing, and other medication related problems.<sup>3</sup> Therefore, it is recommended that the public should be educated on the use of OTC medications to increase their knowledge and awareness and facilitate responsible self-care. The use of prescription medications is helpful to treat illnesses when they are used under the advice of physicians for appropriate diagnoses. It has been reported that self-medication is common practice among consumers in developing countries, and prescription medications can be purchased without a prescription.<sup>4,5</sup> In Kuwait, a self-medication prevalence of 92% has been reported among adolescents.<sup>6</sup> A study from Bahrain reported that 44.8% of medical students have self-medicated.<sup>7</sup> The most commonly reported reasons for self-medication were time saving and minor illnesses. In Saudi Arabia, a recent study reported that 35% of patients attending primary care centers have some experience with self-medication.<sup>8</sup> Factors contributing to self-medication were male gender, young age, poor health status, and dissatisfaction with health care.<sup>8</sup> This differs from international studies reporting high levels of education and professional status as predictive factors for self-medication.<sup>9</sup> Although there are regulations for prescription and OTC medications use, it is common to buy prescription medications without a prescription in Saudi Arabia. A study in 1992 reported that 35% of medications that were dispensed over the counter in community pharmacies in Riyadh were actually prescription only medications.<sup>5</sup> This is a very old study, and awareness of self-medication might have changed over the past 2 decades. However, with the easy and unrestricted access to medications from community pharmacies and lack of advice from the pharmacists there is a great risk of self-medication without a healthcare

provider consultation. Estimating the prevalence of self-medication and ascertaining the reasons behind it will enable policy makers and community pharmacists to ensure safe use of medications by consumers. Previous studies on self-medication in Saudi Arabia among consumers in community pharmacies are limited. Therefore, the aims of this study were to estimate the prevalence of self-medication and assess the knowledge, attitudes, and perception toward self-medication of consumers attending community pharmacies in Riyadh, Saudi Arabia.

**Methods.** This was a prospective cross-sectional survey conducted in Riyadh city, Kingdom of Saudi Arabia. Community pharmacies within 5 areas of the city (North, South, West, East, and Middle) were randomly selected and the study was conducted over 4 weeks in May 2011. Every third pharmacy from the 5 regions was selected. Data collectors distributed the questionnaires to consumers buying medications with or without prescriptions from the selected pharmacies at different times of the day. Training on the data collection method was provided to all data collectors. Consumers buying cosmetics and medical equipment were not approached. In cases where consumers were illiterate, their caregivers were asked to interview them and complete the questionnaire on their behalf. A self-administered questionnaire was prepared in English after reviewing literature for similar studies.<sup>5,10,11</sup> The questionnaire was translated into Arabic language by an experienced translator. Initially, the content validity was conducted by a group of 5 pharmacists to review the questionnaire for clarity and understanding by the public. Face validity was tested on a pilot of 5 community pharmacy customers. During the pilot study the questions were found to be clear for the respondents.

In addition to questions regarding participants' demographic characteristics, the questionnaire consisted of questions with closed- and open-ended responses. In the demographic characteristics section, participants were asked to provide their age, gender, educational level, and employment status. In addition, the survey also included questions on the type of medication purchased, the indication for OTC medication use, sources of medications information, and reasons for buying medications without a prescription. Open-ended questions were used to provide in-depth information.

Consumers were requested to list all medications they bought during that visit without prescription. These medications were then checked against the Saudi Food and Drug Authority (SFDA) list of human medications and subsequently classified into prescription only or

OTC medications.<sup>12</sup> Consumers' knowledge of self-medication was assessed by asking 4 questions with yes or no responses. A scoring system was designed in this study to determine consumers' knowledge. A score of one was given to a yes response, and a score of zero was given to a no response. The total score for knowledge domain ranged from 0-4. The scores were summed, and the total knowledge score was calculated. A cut off level of <2 was considered poor knowledge, and a score of  $\geq 2$  was considered adequate knowledge of self-medication. Consumers' attitude toward self-medication was assessed by asking 4 questions. The responses to the first and second questions were scored as follows: 0=never, 1=rarely, 2=occasionally, 3=sometimes, 4=frequently, 5=usually, 6=always; whereas the same scoring was reversed for responses to the third and fourth questions as shown in the results. The responses were summed and the total attitude score was calculated. The total attitude score ranged from 0-24. A score of <12 was considered negative attitude, and a score of  $\geq 12$  as positive attitude toward self-medication. Perception toward self-medication was assessed by asking 2 questions. The responses to the first question were scored as: 0=never, 1=rarely, 2=occasionally, 3=sometimes, 4=frequently, 5=usually, 6=always; the responses to the second question were reversed. The total score ranged from 0-12. A cut of level of <6 was considered negative perception, and a score of  $\geq 6$  was considered positive perception.

Permission to conduct the study was obtained from each pharmacy manager of the participating community pharmacies and the Research and Ethics Committee at the College of Pharmacy, King Saud University, Riyadh, Saudi Arabia. Data collectors gave a brief introduction to the consumers by explaining the aims and significance of the study. Verbal consent was obtained from all participants. Confidentiality of data was maintained throughout the study.

We utilized the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 18 to analyze the study data. Results are displayed as counts and percentages. Descriptive statistics were used to illustrate respondents' demographic characteristics, and list of medication classes. Categorical variables were presented as count and percentages and continuous variables as mean and standard deviation. The Shapiro-Wilk test was used to test the distribution of the responses. Kruskal-Wallis Test or Mann Whitney Test was used where appropriate.

**Results. Demographic characteristics.** A total of 538 consumers visiting community pharmacies in Riyadh city, participated in the survey while a further

169 refused to participate, giving a response rate of 76%. Most responders were male, the participants were predominantly in the age group (23-33 years), and were university graduates. A more detailed description of socio-demographic characteristics is provided in Table 1.

**Self-medication practice.** A total of 285 medications were purchased without prescriptions. Of these, 139 (48.8%) medications should be dispensed by prescription only, and 146 (51.2%) were OTC and can be dispensed without prescription (Table 2). The most common prescription medications dispensed without prescriptions were antibiotics and analgesics/antipyretics.

**Sources of information and reasons for self-medications.** The most common sources of information stated were physicians and pharmacists (n=341, 80.2%), medicine pamphlets (n=246, 58%), followed by friends and family (n=113, 27%), and online sources (n=95, 22%). Medication side effects (n=275, 65%), and medication use (n=273, 64%) were the most common facts of information that participants were interested in knowing about their medications. The most common reasons for buying medication without prescription was that the symptoms were perceived to be too minor to consult a physician (n=227, 54%), followed by time saving (n=167, 40%) and minor illnesses for which

**Table 1** - Sociodemographic characteristics of 538 community pharmacy customers.

| Variables                 | Frequency (%) |
|---------------------------|---------------|
| <i>Region</i>             |               |
| North                     | 88 (16.4)     |
| South                     | 96 (17.8)     |
| Middle                    | 133 (24.7)    |
| East                      | 114 (21.2)    |
| West                      | 107 (19.9)    |
| <i>Age</i>                |               |
| 12-22 years               | 75 (13.9)     |
| 23-33 years               | 188 (34.9)    |
| 34-44 years               | 163 (30.3)    |
| 45-55 years               | 85 (15.8)     |
| >56 years                 | 27 (5.0)      |
| <i>Gender</i>             |               |
| Male                      | 392 (72.9)    |
| Female                    | 146 (27.1)    |
| <i>Level of education</i> |               |
| No formal education       | 24 (4.5)      |
| Elementary School         | 49 (9.1)      |
| Intermediate School       | 22 (4.1)      |
| High school               | 160 (29.7)    |
| Diploma                   | 28 (5.2)      |
| University graduates      | 227 (42.2)    |
| Postgraduates             | 28 (5.2)      |

the participants knew the treatment that was required (n=168, 40%).

**Knowledge of self-medication.** Based on the knowledge total score, 375 (69.7%) participants had poor knowledge (score of <2) regarding self-medication. A total of 367 (68.2%) participants did not know whether the medicine they bought is a prescription-only or an OTC medication. It was interesting that 44.5% of consumers did not tell the pharmacist of other medications they use at home at the time of buying medications without prescription (Table 3).

**Attitude toward self-medication.** Based on the attitude total score (0-24), 337 (62.6%) participants had positive attitude (score of ≥12) toward self-medications. However, a total of 166 (43.7%) participants indicated

that they always read the medication pamphlet, and only 156 (29.2%) participants believe that buying medication without prescription is not safe practice (Table 4).

**Perception of self-medication.** Based on the perception total score (0-12), most participants (321, 59.7%) had negative perception of self-medication. A total of 56 (21.3%) of the participants indicated that the pharmacist does not provide information on drug interactions for the medications they purchased without prescription and their current medications (Table 5).

**Association of demographic characteristics with knowledge, attitude, and perception.** Among demographic characteristics, occupation was significantly associated with the mean knowledge score ( $p=0.044$ ). Whereas, education level ( $p<0.001$ ), and occupation ( $p=0.013$ ) were significantly associated with the mean perception score (Table 6). A post hoc analysis revealed that those who are employed had a statistically significantly higher mean knowledge score than students. Those who had a diploma had a statistically significant lower mean perception score than those who had a university level of education.

**Table 2 -** Medications bought without prescriptions among 285 consumers from community pharmacies.

| Medications                | Prescription only medications | OTC medications   |
|----------------------------|-------------------------------|-------------------|
| <b>Total</b>               | <b>139 (48.8)</b>             | <b>146 (51.2)</b> |
| Analgesics/antipyretics    | 27 (19.4)                     | 61 (41.8)         |
| Cough preparations         | 4 (2.9)                       | 27 (18.5)         |
| Antibiotics                | 31 (22.3)                     | 0                 |
| Anti-allergy               | 10 (7.2)                      | 15 (10.2)         |
| Vitamins                   | 2 (1.4)                       | 10 (6.8)          |
| Anti-diabetics             | 9 (6.5)                       | 0                 |
| Cardiovascular medications | 8 (5.8)                       | 0                 |
| Antiulcer                  | 1 (0.7)                       | 7 (4.8)           |
| Oral contraceptives        | 7 (5.0)                       | 0                 |
| Eye/ear drops              | 4 (2.9)                       | 2 (1.4)           |
| Dermatology preparations   | 3 (2.2)                       | 2 (1.4)           |
| Antifungal                 | 4 (2.9)                       | 0                 |
| Antidepressants            | 4 (2.9)                       | 0                 |
| Asthma medications         | 4 (2.9)                       | 0                 |
| Antidiarrhea               | 1 (0.7)                       | 1 (0.7)           |
| Others                     | 20 (14.3)                     | 21 (14.4)         |

Data are expressed as number and percentage (%),  
OTC - over the counter

**Table 3 -** Knowledge of self-medication among 538 consumers visiting the community pharmacies in Riyadh city, Saudi Arabia.

| Knowledge items   | Yes        | No         |
|---|------------|------------|
| Do you know whether the medicine you just purchased needs a prescription or not?  | 171 (31.8) | 367 (68.2) |
| Do you know the route of administration, dosage, and side effects of the medicine you purchased without a prescription? | 260 (64.8) | 141 (35.2) |
| Have you ever used prescription medications along with medications you purchased without prescription?                  | 48 (18.1)  | 217 (81.9) |
| When you buy a medication without a prescription, do you tell the pharmacist of other medications you use at home?      | 96 (55.5)  | 77 (44.5)  |

Data are expressed as number and percentage (%)

**Discussion.** The results revealed several interesting findings regarding the knowledge, attitudes, and perception of self-medication among consumers attending community pharmacies in Riyadh city. Almost half of the medications that consumers bought from community pharmacies without a prescription were actually prescription-only medications, and 45% of the participants did not tell the pharmacist of the prescribed medication(s) that they were using at home. Overall, most participants had poor knowledge, positive attitude, and negative perception toward self-medications. Information regarding medications was most commonly obtained from a physician and pharmacist, medicine pamphlets, followed by friends and family, and online sources. Minor illnesses, time saving, and perceived knowledge, and treatment of disease were common reasons for seeking self-medication.

Several studies have been conducted on self-medication worldwide. A study by Bawazir (1992)<sup>5</sup> in Riyadh showed that 35% of medications bought by patients from community pharmacies without a prescription were prescription only medications; however, in the current study, after 2 decades, we found a higher rate. A study in Tanzania found that 37% of medications requested by customers without a prescription from community pharmacies were prescription only medications,<sup>4</sup> which is lower than our

**Table 4 -** Consumers attitudes regarding self-medication in Riyadh city, Saudi Arabia.

| Attitude items  | Always     | Usually   | Frequently | Sometimes<br>n (%) | Occasionally | Rarely   | Never      |
|---|------------|-----------|------------|--------------------|--------------|----------|------------|
| When you buy a medication without prescription, do you read the pamphlet?   | 166 (43.7) | 38 (10.0) | 33 (8.7)   | 56 (14.7)          | 35 (9.2)     | 24 (6.3) | 28 (7.4)   |
| When you buy a medication without a prescription, do you ask the pharmacist for information regarding the medication? | 142 (37.3) | 45 (11.8) | 50 (13.1)  | 70 (18.4)          | 43 (11.3)    | 21 (5.5) | 10 (2.6)   |
| Do you think buying a medication without prescription is a safe way of using medication?                              | 35 (6.5)   | 33 (6.2)  | 45 (8.4)   | 129 (24.1)         | 86 (16.1)    | 51 (9.5) | 156 (29.2) |
| Do you believe that you should consult with pharmacist directly without seeing the physician?                         | 31 (5.8)   | 54 (10.1) | 72 (13.4)  | 124 (23.1)         | 99 (18.4)    | 50 (9.3) | 107 (19.9) |

**Table 5 -** Consumers' perception regarding self-medication in Riyadh city, Saudi Arabia.

| Perception items   | Always    | Usually  | Frequently | Sometimes<br>n (%) | Occasionally | Rarely    | Never      |
|--|-----------|----------|------------|--------------------|--------------|-----------|------------|
| Does the pharmacist provide information on drug interactions of the medications you have purchased without a prescription and those you are currently using? | 42 (16.0) | 26 (9.9) | 26 (9.9)   | 54 (20.5)          | 31 (11.8)    | 28 (10.6) | 56 (21.3)  |
| Do you find it difficult when searching for information on medication?   | 32 (7.9)  | 24 (5.9) | 20 (4.9)   | 81 (20.0)          | 79 (19.5)    | 57 (14)   | 113 (27.8) |

**Table 6 -** The mean scores of knowledge, attitude, and perception among consumers' demographic characteristics in Riyadh city, Saudi Arabia.

| Demographic characteristics | Knowledge score<br>Mean± SD | P-value | Attitude score<br>Mean± SD | P-value | Perception score<br>Mean± SD | P-value |
|-----------------------------|-----------------------------|---------|----------------------------|---------|------------------------------|---------|
| <i>Age*</i>                 |                             | 0.052   |                            | 0.161   |                              | 0.145   |
| 12-22 years                 | 0.80±0.78                   |         | 12.01±4.42                 |         | 4.44±3.70                    |         |
| 23-33 years                 | 1.06±0.89                   |         | 13.20±4.70                 |         | 4.39±3.57                    |         |
| 34-44 years                 | 1.19±1.04                   |         | 13.71±4.97                 |         | 4.61±3.65                    |         |
| 45-55 years                 | 1.00±0.95                   |         | 12.90±4.90                 |         | 3.36±3.39                    |         |
| >56 years                   | 1.25±0.94                   |         | 13.40±5.68                 |         | 4.62±3.24                    |         |
| <i>Gender**</i>             |                             | 0.272   |                            | 0.410   |                              | 0.629   |
| Male                        | 1.09±0.93                   |         | 13.06±4.79                 |         | 4.27±3.52                    |         |
| Female                      | 0.99±0.98                   |         | 13.40±4.98                 |         | 4.44±3.74                    |         |
| <i>Level of education*</i>  |                             | 0.058   |                            | 0.300   |                              | <0.001  |
| Illiterate                  | 0.08±1.01                   |         | 11.16±4.17                 |         | 3.79±2.46                    |         |
| Primary School              | 0.93±0.87                   |         | 12.44±4.10                 |         | 5.16±3.43                    |         |
| Intermediate School         | 1.18±0.85                   |         | 13.04±4.99                 |         | 5.40±4.27                    |         |
| High school                 | 0.60±0.73                   |         | 13.39±4.56                 |         | 4.33±3.60                    |         |
| Diploma                     | 1.09±0.94                   |         | 12.39±5.21                 |         | 1.42±2.98                    |         |
| University graduate         | 1.10±0.96                   |         | 13.38±5.09                 |         | 4.44±3.57                    |         |
| Postgraduates               | 1.21±1.10                   |         | 13.71±5.41                 |         | 4.21±3.43                    |         |
| <i>Occupation*</i>          |                             | 0.044   |                            | 0.288   |                              | 0.013   |
| Student                     | 0.91±0.89                   |         | 12.33±4.50                 |         | 4.09±3.60                    |         |
| Employed                    | 1.16±0.98                   |         | 13.43±4.86                 |         | 4.09±3.52                    |         |
| Unemployed                  | 0.90±0.88                   |         | 13.19±4.94                 |         | 4.83±3.76                    |         |
| Retired                     | 1.27±0.88                   |         | 12.31±5.56                 |         | 4.09±2.97                    |         |
| Others                      | 0.91±0.82                   |         | 13.15±4.84                 |         | 6.13±3.58                    |         |
| <b>Total</b>                | 1.06±0.94                   |         | 13.15±4.84                 |         | 4.31±3.58                    |         |

Kruskal-Wallis test\*, Mann-Whitney Test\*\*

study findings. A study from Kuwait,<sup>6</sup> a neighboring country of Saudi Arabia, investigating self-medication among adolescents reported that the main source of information regarding medications was the parents. This is also consistent with the findings of our study in which family and friends were one of the most common sources of medication information. In Bahrain, another neighboring country, it was found that the most common reasons for seeking self-medication were time saving, involved minor illness that does not need a visit to a doctor, and cost saving.<sup>7</sup> This was similar to our findings with the exception of financial reasons, as only 9% of respondents in our study sought self-medication due to financial difficulties. Our study revealed that around 45% of the participants did not inform the pharmacist of other medications that they used at home. This is similar to a finding from a recent study in Malaysia,<sup>13</sup> in which it was reported that 60% of community pharmacy customers did not inform the pharmacist of prescription medications that they used at home.

The unauthorized prescribing of antibiotics is associated with multiple-drug resistance and therefore, they must be prescribed under physician advice.<sup>14</sup> Our results suggest that the practice of community pharmacy customers in Saudi Arabia regarding antibiotic use has not changed over the past 2 decades. The frequency of dispensing antibiotics without a prescription reported in our study (22.3%) was the same as that (20.9%) in a study conducted in 1992 in Riyadh.<sup>5</sup> Another recent study in Riyadh using simulated clinical scenarios reported that 78% of community pharmacies in Saudi Arabia dispense antibiotics without prescriptions.<sup>14</sup> In Spain,<sup>15</sup> a simulation study reported that the prevalence of antibiotics dispensing without prescription for urinary tract infection was 79.7%, 34.8% for sore throat, and 16.9% for bronchitis.<sup>16</sup> Another simulation study from Europe reported that Ciprofloxacin was dispensed without prescription in 53% of the cases.<sup>17</sup>

The study emphasizes several aspects of medication safety with regard to self-medication. Benefits, risks, and precautions of self-medication need to be explained to the consumers. This can be accomplished partially through activities organized by educational institutions and non-governmental organizations. The role of community pharmacists is important in guiding the consumer to ensure appropriate medication use. The WHO emphasizes that pharmacists should help patients to undertake appropriate and responsible self-medication, and if necessary refer the patient for medical advice.<sup>1</sup> Healthcare authorities have responsibilities in enforcing the rules and regulations

governing the sale of prescription only medications without a prescription. Pharmacists should be instructed not to sell prescription medications without prescription. In addition, educational workshops for pharmacists and undergraduate pharmacy curriculum updates are necessary to ensure appropriate community pharmacy practice regarding the sale of prescription/non-prescription medications.

Irresponsible self-medication is common in Saudi Arabia. Sources of information were not appropriate, and knowledge and perception of self-medication were inadequate. Community pharmacists should take the initiative to actively counsel consumers and provide information regarding possible drug interactions when dispensing medications. Educational campaigns for the public on self-care, and responsible self-medication should be strengthened. Future studies should focus on improving the consumers' awareness of self-medication and the proper use of medications.

Our study has several limitations that can limit the generalization of the findings. Although we used a standard sampling method, selection bias could be present as not all community pharmacies in Riyadh were included. In addition, almost three-quarters of the participants were male due to the social consideration in Saudi Arabia as females rarely visit community pharmacies and tend to send their male relatives or drivers to buy their medications. The most common source of information mentioned by the consumers was physicians and pharmacists; however, we could not clearly distinguish between them. We could not ascertain if patient economic status was contributing to self-medication because patient monthly income data was not collected. In addition, the study was conducted in the summer and perhaps if similar study was conducted in the winter the prevalence might be higher as many consumers visit community pharmacies asking for antibiotics to treat cold symptoms.

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