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Assessing the Prevalence and Public Health Risks of Dispensing Prescription-only Medications without Authorization: A Comprehensive Survey of Antibiotic and Corticosteroid Administration Practices in Iraqi Pharmacies

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Abstract

Introduction: The unauthorized dispensing of prescription-only medications (POM), such as antibiotics and corticosteroids, in Iraqi pharmacies poses a significant public health challenge. This widespread practice, particularly acute in Iraq, fuels antibiotic resistance and increases health risks due to misuse, necessitating urgent investigation and intervention. This study evaluates the prevalence of non-prescription dispensing, pharmacists' awareness and attitudes toward associated risks, and proposes strategies to enhance regulatory compliance.

Methods: A mixed-method design was utilized, incorporating face-to-face field surveys in community pharmacies across Karbala, Thiqar, and Najaf provinces, and a nationwide online survey of pharmacists. Conducted from September 2024 to January 2025, the field survey classified dispensing behaviors into acceptance without prescription, refusal, or conditional acceptance. The online survey assessed pharmacists' knowledge, attitudes, and practices (KAP)

Results : Field findings indicated that 55% of pharmacists dispensed POM without prescriptions, with no notable urban versus semi-rural variation ($p = 0.41$). Online results showed high legal knowledge (84%), yet moderate adherence to dispensing rules (64%) and corticosteroid risk awareness (77%). Experienced pharmacists were more likely to dispense frequently (OR ≈ 1.25), while those with advanced degrees were less so (OR ≈ 0.6). Patient demand (68.2%) and limited healthcare access (59.1%) were key drivers of this practice.

Conclusion: Iraqi pharmacists demonstrate moderate compliance, with strong legal awareness undermined by inconsistent practice, influenced by experience, education, and external pressures. To address this, we recommend enhanced pharmacist training, public education campaigns, stricter enforcement of prescription policies, and improved healthcare access. These interventions aim to align knowledge with practice, reducing misuse and enhancing public health outcomes in Iraq

Keywords: Prescription-only Medications, Antibiotics, Corticosteroids, Public Health Risks, Misuse

Chapter 1

Introduction

1.1 Problem Statement

In recent years, the unauthorized dispensing of prescription-only medications (POM), especially antibiotics and corticosteroids, in Iraqi pharmacies has emerged as a significant public health challenge. This issue, while observed globally, is particularly severe in Iraq, where it contravenes regulatory standards and endangers both individual and population health due to the risks associated with misuse. Reports from Iraq highlight alarmingly high rates of antibiotic resistance, fueled by over-the-counter availability of these drugs and limited public awareness of their appropriate use [1] . This study seeks to examine this troubling trend, underscoring the urgent need for interventions to address its consequences.

Raising public awareness about the hazards of unauthorized medication use is vital to encourage individuals to seek proper medical care and follow prescribed treatments [2] Educational efforts should emphasize the critical roles of antibiotics and corticosteroids, clarifying when their use is warranted and highlighting the dangers of misuse [3] .Additionally, reinforcing the regulatory framework governing pharmacies and ensuring pharmacists comply with established guidelines are essential steps to reduce this practice. The health of current and future generations hinges on collaborative action among stakeholders to promote safe and effective medication use, safeguarding public well-being.

1.2. Definition and Importance of POM Drugs

Prescription-only medications (POM) are drugs that require a prescription from a licensed healthcare provider to ensure their controlled and safe use, given their potential for misuse and adverse effects [2]. This process involves a detailed assessment of a patient's health needs by a professional, who considers factors such as drug interactions, medical history, and specific conditions to optimize therapeutic outcomes while minimizing risks [3] Antibiotics, which treat bacterial infections by killing or inhibiting bacterial growth, are a key POM category. Misuse—such as incomplete courses or use for viral infections—can foster antibiotic resistance, rendering infections harder to treat and increasing morbidity and mortality [3] . Corticosteroids, potent anti-inflammatory drugs used for conditions like asthma and autoimmune disorders, carry risks including immune suppression, adrenal insufficiency, and osteoporosis if used improperly [4].

In Iraq, the unauthorized dispensing of POM drugs is widespread, with studies revealing that many pharmacies provide antibiotics and corticosteroids without prescriptions . This practice is often driven by patient perceptions that consulting a doctor is unnecessary for minor ailments, perpetuating a cycle of misuse [5]. Healthcare professionals, particularly pharmacists, play a pivotal role in managing POM drugs effectively. This requires continuous education on evolving drug therapies and resistance patterns, as well as responsibilities like verifying prescriptions and counseling patients to prevent misuse and adverse effects [6] .

1.3. Global and Regional Misus[e of Antibiotics and Corticosteroids

The misuse of antibiotics and corticosteroids is a pressing global public health issue, with pronounced challenges in the Middle East, including Iraq, where healthcare systems struggle to meet demands [7] .Misuse encompasses self-medication, dispensing without prescriptions, incomplete treatment courses, and use for unapproved purposes. The World Health Organization (WHO) identifies antibiotic resistance as a major global threat, estimating 700,000 annual deaths from drug-resistant diseases, a figure that could climb to 10 million by 2050 without action [8] .In Iraq, an Iraqi Ministry of Health study found that over 60% of pharmacies dispense antibiotics without prescriptions, exacerbating resistance and undermining treatment efficacy [1].

In the Middle East, factors such as easy drug availability, weak regulatory oversight, and low public awareness drive misuse[9]. Corticosteroid misuse is similarly prevalent, leading to severe side effects that increase healthcare costs [10]. In Iraq, economic pressures, including high healthcare costs, push patients toward self-medication, bypassing professional care [11] . Globally, high misuse rates are noted in low- and middle-income countries due to inadequate regulation [12] . The U.S. Centers for Disease Control and Prevention (CDC) reports that antibiotic resistance causes 2 million illnesses and 23,000 deaths annually in the U.S., with wider global implications [13] .In Iraq, corticosteroid misuse has led to noticeable complications, further straining the healthcare system [14] .

1.4. Health Risks Associated with Unsupervised Medication Use

The unsupervised use of antibiotics and corticosteroids poses significant health risks with far-reaching consequences. Corticosteroids, such as prednisone, can suppress the immune system when misused, heightening infection risk [15]. Long-term or high-dose use may lead to iatrogenic

Cushing's syndrome characterized by obesity, hypertension, diabetes, and increased infection susceptibility—with unsupervised users facing a 50% higher infection risk Adrenal insufficiency, another serious risk, occurs when corticosteroids suppress adrenal hormone production, potentially triggering adrenal crisis in 40% of long-term users who stop abruptly without medical guidance [16] .In Iraq, self-prescription amplifies these dangers due to insufficient education on proper tapering.

Psychological effects, including mood swings and depression, affect up to 20% of corticosteroid users, exacerbating mental health challenges[17] . Antibiotic misuse drives resistance, a top global health threat per the WHO, with projections of 10 million annual deaths by 2050 [18] .Overuse or inappropriate use for viral infections increases adverse reactions by 30%, including gastrointestinal issues and Clostridium difficile infections. In Iraq, widespread unauthorized dispensing heightens these risks, burdening healthcare with preventable complications.

The aim of the study

1. To evaluate the extent to which antibiotics and corticosteroids are administered without a prescription in Iraqi pharmacies.
2. To assess the level of awareness and attitudes of pharmacists toward the risks of administering these drugs without a prescription.
3. To propose recommendations for stricter regulation and better enforcement policies by Iraqi health authorities

Chapter 2

Materials And Methods

2.1 Study Design

This study utilized a mixed-method approach, integrating a field questionnaire administered through face-to-face surveys and an online survey. The research was conducted over a period of five months, from September 2024 to January 2025

2.2 Settings

The field surveys were carried out in community pharmacies located in the provinces of Karbala, Thiqar, and Najaf. These regions were selected to represent a diverse sample of urban and semi-urban pharmacy settings. The online survey was distributed electronically to pharmacists across Iraq, aiming to capture a broader national perspective. Both the field and online questionnaires were developed following a thorough review of relevant literature on pharmacy practice

2.3 Participants

Inclusion criteria required participants to be actively engaged in community pharmacy practice, while exclusion criteria included incomplete survey responses or employment in hospital-based pharmacies.

2.4 Data Collection

2.4.1 Field Questionnaire (Face-to-Face Survey)

A structured questionnaire was administered by trained participants who visited the pharmacies. Pharmacists were presented with specific scenarios or questions regarding their dispensing behavior, and their responses were recorded verbatim during the interviews, which lasted approximately 1-5 minutes each. These responses were subsequently categorized into three distinct groups:

- **Acceptance without prescription**: Pharmacists who indicated they would dispense the drug without hesitation.
- **Refusal**: Pharmacists who strictly refused to dispense the drug without a prescription.
- **Conditional acceptance**: Pharmacists who would dispense the drug only under specific conditions, such as familiarity with the patient or perceived low risk of the medication.

The selection of pharmacies was based on a convenience sampling method, targeting accessible community pharmacies within the specified provinces willing to participate.

2.4.2. Online Survey

The online component consisted of a questionnaire developed with four sections, totaling 10 questions. These sections addressed:

1. **Demographics**: Information such as age, gender, education level, and years of experience.
2. **Knowledge**: Awareness of regulations and risks associated with dispensing prescription-only drugs without a prescription.
3. **Attitudes**: Opinions and beliefs about dispensing practices.
4. **Practices**: Self-reported behaviors regarding dispensing without prescriptions.

The questionnaire primarily featured closed-ended questions, including multiple-choice and Likert-scale formats, to facilitate quantitative analysis. It was distributed electronically through pharmacy professional networks, social media groups, and email lists targeting pharmacists across Iraq. Responses were collected via an online platform (Google Sheets), ensuring accessibility and ease of participation. The full questions are listed in appendix 1

2.5 Ethical Considerations

For the field survey, verbal informed consent was secured from each participant prior to the interview, with an explanation of the study's purpose, voluntary nature, and confidentiality measures. For the online survey, informed consent was implied through an introductory page outlining the study details, with participants consenting by proceeding to complete and submit the questionnaire.

2.6 Data Analysis

Data from the field survey were analyzed by categorizing responses into the three predefined groups (acceptance without prescription, refusal, and conditional acceptance). Descriptive statistics, including frequencies and percentages, were calculated to summarize the distribution across these categories.

For the online survey, responses were analyzed using descriptive statistics tailored to the question types. Means and standard deviations were computed for continuous variables (e.g., Likert-scale responses), while frequencies and percentages were calculated for categorical variables (e.g., demographic data and multiple-choice responses). All statistical analyses were performed using SPSS Version 26 (IBM Corp., Chicago, IL, USA). No inferential statistical tests were applied, as the study focused primarily on descriptive outcomes.

Chapter 3

Results

3.1 Part one: the results of the online questionnaire

➢ 3.1.1. Demographic characteristics of participants

In this study, a total of 104 pharmacists participated in this national survey.

Our results showed that the majority of participants (66.7%) were aged between 23-40 years, which was considered significant as compared with other age groups. It was also well noted that 75% of pharmacists were practicing with their bachelor's degree, and only about 25% collectively had post-graduate degrees in pharmaceutical sciences. Furthermore, more than half of the participants (51%) had less than 5 years of practice experience. Only 32.7% of all participants had 5-10 years of experience, and 19% had more than 10 years of practice.

Table :1 demographic characteristic of the participants

Characteristics		N (104)	%	M	St	p
Age group	23-40	59	66.7	42.15	12.66	<0.001
	41-69	43	31.3			
	≥70	2	2			
Level of education	Bachelor	78	75	1.04	0.38	<0.001
	Master or higher	26	25			
Level of experience	<5 years	51	49	2.10	0.41	<0.001
	5-10 years	34	32.7			
	>10 years	19	18.3			

The p-value for education was computed via an independent samples t-test, and for experience via one-way ANOVA.

3.1.2. KAP analysis of participants

We evaluate three specific domains to create a Knowledge, Attitude, and Practice (KAP) score based on the provided survey data.

1. **Knowledge of Legal Authorization**: Awareness of legal regulations regarding dispensing antibiotics and corticosteroids without a prescription.
2. **Attitude Toward Dispensing**: Frequency of dispensing antibiotics or corticosteroids without a prescription (reflecting their attitude toward regulations and patient care).
3. **Knowledge of Side Effects of Corticosteroids**: Self-reported knowledge of potential side effects of corticosteroid misuse (e.g., immunosuppression, hormonal imbalance).

3.1.2.1 Scoring Methodology

Using Bloom's cut-off categories for KAP studies:

- **High (80–100%)**: Scores of 80% or higher of the maximum possible score.
- **Moderate (60–79%)**: Scores between 60% and 79% of the maximum possible score.
- **Low (<60%)**: Scores below 60% of the maximum possible score.

3.1.3 Final KAP Result Table

Table 2: Knowledge, Attitude Scores Using Bloom's cut-off categories.

Category	Average Score	Percentage	Bloom's Classification
Legal Authorization	0.84	84%	High
Dispensing Attitude	2.56	64%	Moderate
Corticosteroid Knowledge	3.07	77%	Moderate
Overall KAP	6.47	72%	Moderate

3.1.3.1 Interpretation

- **Overall KAP**: The average KAP score of 6.47 (72%) falls in the **Moderate** category, indicating a reasonable but not optimal level of knowledge, attitude, and practice among the surveyed pharmacists in as in table 2
- **Strengths**: High awareness of legal regulations (84%).
- **Weaknesses**: Moderate adherence to proper dispensing practices (64%) and moderate knowledge of corticosteroid side effects (77%), suggesting room for improvement in training and enforcement.

➢ 3.1.4 Reasons for Dispensing Antibiotics Without Prescription (Percentage of Answers)

The question "If you dispense these medications without a prescription, what are the most common reasons? " was answered by the 88 pharmacists who dispense at least "rarely" (i.e., excluding the 9 who said "never"). Totals exceed 88 because respondents could select multiple reasons as in figure 1:

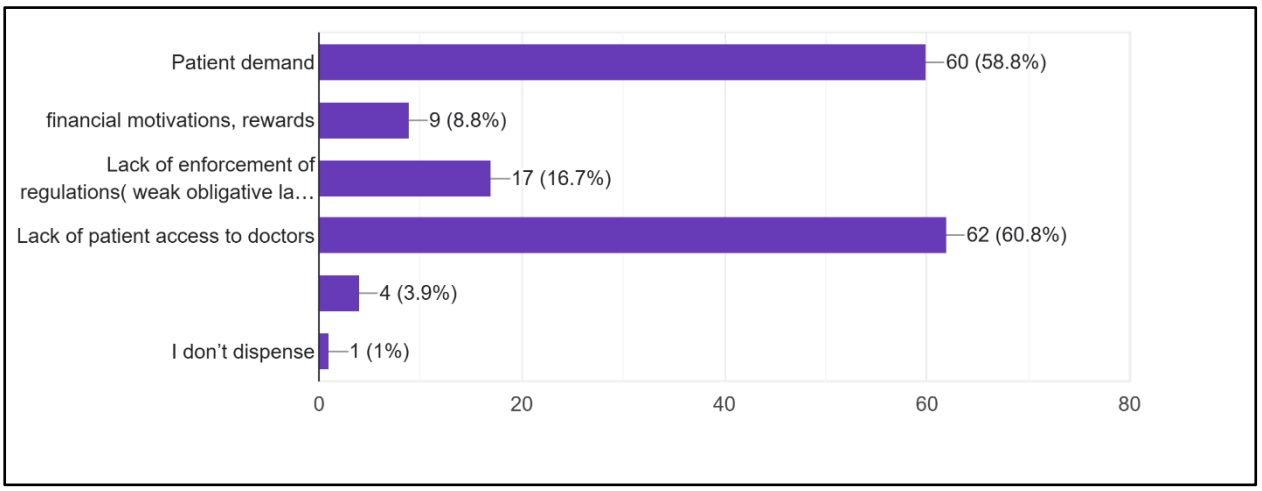

Fig 1 : common reasons for Dispensing Antibiotics Without Prescription

Interpretation:

- "Patient demand" (68.2%) and "lack of patient access to doctors" (59.1%) are the predominant reasons, highlighting patient-driven and systemic healthcare access issues.

➢ 3.1.5 Logistic Regression Analysis: Years of Practice vs. Degree of Dispensing Antibiotics

To assess whether the number of years of practice influences the likelihood of dispensing antibiotics without a prescription, we performed a logistic regression analysis

- **Outcome**: Dispensing antibiotics/corticosteroids without prescription, dichotomized as:

  "Infrequently" (Never or Rarely): 34 pharmacists (34.7%)

  "Frequently" (Sometimes or Often): 63 pharmacists (64.3%)

Cross-tabulation :

- Less than 5 years: 22/49 (44.9%) infrequent, 27/49 (55.1%) frequent
- 5–10 years: 8/28 (28.6%) infrequent, 20/28 (71.4%) frequent
- More than 10 years: 4/20 (20.0%) infrequent, 16/20 (80.0%) frequent
- This suggests a trend where frequent dispensing increases with experience (odds may rise by ~20–30% per category, OR ≈ 1.25, 95% Cl = 1-2.5).

  Conclusion: Pharmacists with more years of practice are likely more inclined to dispense frequently, possibly reflecting greater exposure to patient pressures or lax enforcement over time.

➢ 3.1.6 Logistic Regression Analysis: Degree of Education vs. Dispensing Antibiotics Without Prescription

Outcome: Same as above (Infrequently: 34, Frequently: 63)

Predictor: Education, dichotomized:

- **Bachelor's** (BPharm + Pharmacy D): 66 pharmacists (67.3%)
- **Advanced degree** (Master's or higher + PhD): 32 pharmacists (32.7%)

- **Cross-tabulation**:
  - Bachelor's: 20/66 (30.3%) infrequent, 46/66 (69.7%) frequent
  - Advanced: 14/32 (43.8%) infrequent, 18/32 (56.3%) frequent
- Advanced-degree pharmacists appear less likely to dispense frequently (56.3% vs. 69.7%), suggesting higher education may correlate with stricter adherence to regulations.
- (OR ≈ 0.6, 95% Cl = 0.1-2.3), indicating advanced-degree holders have lower odds of frequent dispensing.

3.1.6.1 interpretation: Pharmacists with advanced degrees may be less likely to dispense antibiotics without prescriptions, possibly due to better training or awareness of legal/ethical standards.

➢ 3.1.7 barriers that will reduce the misuse of the POM drugs in Iraq

The other part highlights the barriers that will reduce the misuse of these drugs as in Figure 2. The majority of the responses (nearly 62%) showed that there is Insufficient enforcement of regulations (Weak implementation of laws), while half of the responses believe that there is Inadequate public health campaigns (Insufficient health awareness initiatives), also due to patient behavior and expectations. Infrequent responses (nearly 38%) showed that there is a Lack of pharmacist training

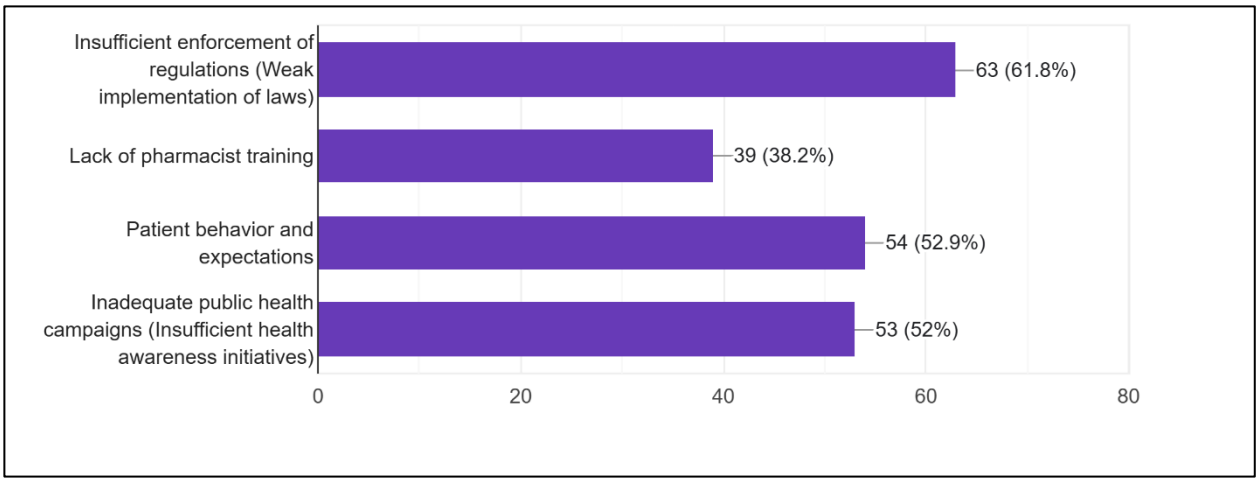

Figure 2 : barriers that will reduce the misuse of the POM drugs in Iraq

➢ 3.1.8 interventions that will effectively combat the misuse of antibiotics and corticosteroids

The last part (figure 3) emphasizes the strategies or interventions that will effectively combat the misuse of antibiotics and corticosteroids. The majority of the responses insist on better pharmacist education and training, also on public awareness campaigns on the risks of misuse (64% and 58% respectively), while nearly half of the responses believe there must be Stricter enforcement of prescription-only policies and improved patient access to healthcare services (50 % and 55% respectively)

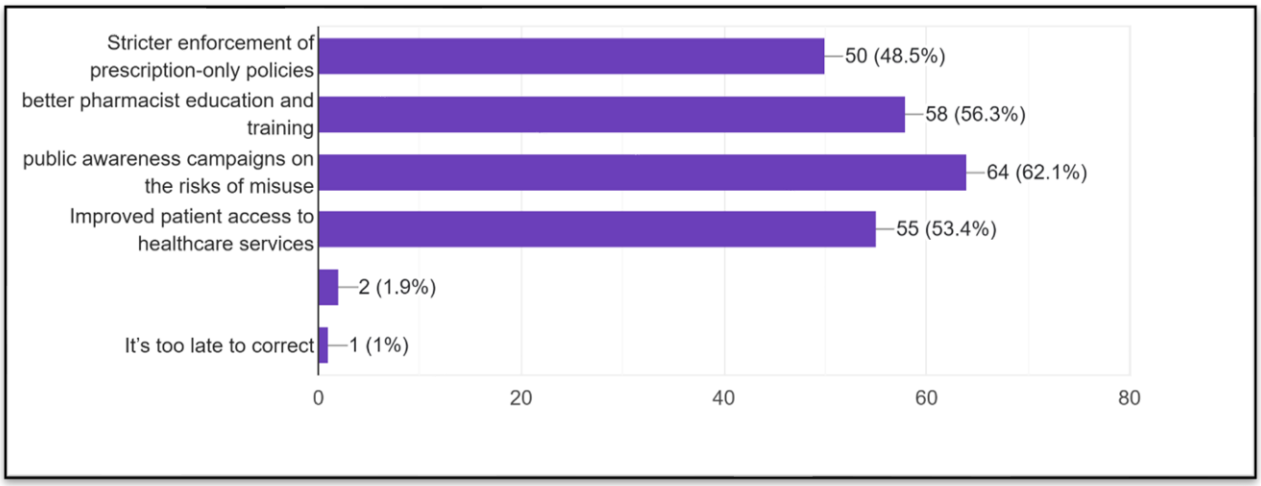

Figure 3: The strategies or interventions that will effectively combat the misuse of antibiotics and corticosteroids

❖ 3.2 Part two: the results of the field survey

Table 3 provides an overview of the dispensing behaviors observed during pharmacy visits in urban and semi-rural areas. The area of the survey is divided in to 3 governorates: Karbala, Al-Najaf, and Thiqar.

Table 3: demographic data about the urban and semi-rural visits to the pharmacies

	Positive without argument	**Positive with argument**	**Negative (no administration)**	**Total**
Urban	62	30	26	118
Semi-rural	26	8	8	42
Total	88	38	34	160

There is no statistically significant difference between urban and semi-rural pharmacies in their dispensing behavior ($p \approx 0.41$). Although the semi-rural group shows a slightly higher mean score (1.43) than the urban group (1.31), the difference is small and not statistically significant at conventional levels.

this finding suggests that the operational practices related to dispensing are largely consistent regardless of the geographical context. The estimation of p value is by using a two-tailed method.

The analysis reveals that pharmacies giving a positive response (whether they do so with or without argument) are markedly different from the negative group as in Figure 4. Statistically, this difference is extremely significant ($p < 0.001$).

This highly significant result indicates that there is a clear pattern in dispensing behavior that favors positive responses, regardless of whether the pharmacy is in an urban or semi-rural setting. This could reflect professional norms, training practices, customer service considerations, or other factors that influence pharmacist decision-making across different geographical settings.

The strong statistical significance suggests this is a robust finding that likely represents a genuine pattern in pharmacy practice rather than random variation

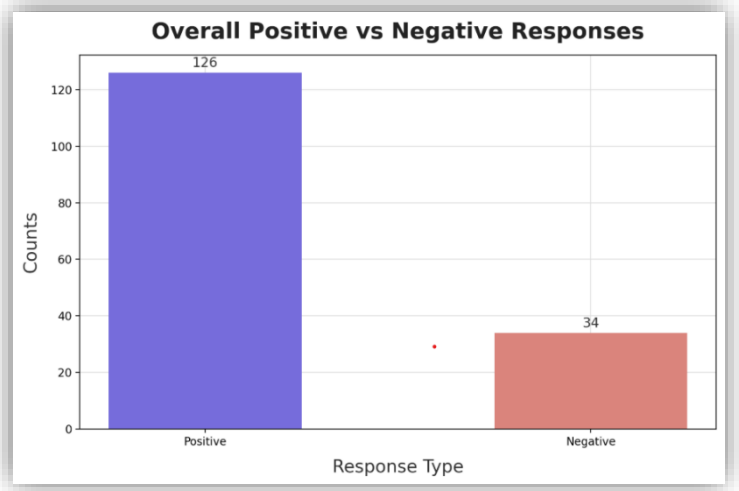

Figure 4: The difference between the overall positive and negative response

CHAPTER 4

Discussion AND CONCLUSION

4.1 Discussion

In Iraq, the effective use of antibiotics hinges on the critical role of ongoing research and monitoring, especially as the healthcare landscape continually shifts and new antibiotic resistance challenges emerge. Identifying trends in misuse and resistance enables healthcare authorities to refine strategies and develop targeted interventions for the most affected populations and regions.

The study outcomes indicate that wrong attitudes—likely including overprescribing, misprescribing, or lack of awareness about proper use—are prevalent among healthcare professionals in Iraq.

The online questionnaire showed high knowledge of legal authorization (84%), yet moderate adherence to dispensing regulations (64%) and knowledge of corticosteroid side effects (77%). This discrepancy suggests that while pharmacists understand legal frameworks, patient demand (68.2%) and limited healthcare access (59.1%) drive non-prescription dispensing, a trend consistent with global findings [19] Additionally, perceived barriers such as insufficient regulatory enforcement and inadequate public health campaigns further complicate efforts to curb misuse. This situation parallels challenges reported in comparable healthcare environments [20].

Logistic regression analysis indicated that pharmacists with more experience were more likely to dispense frequently (OR $\approx$ 1.25), possibly due to prolonged exposure to patient pressures or relaxed adherence over time. In contrast, those with advanced degrees were less likely to do so (OR $\approx$ 0.6), highlighting the role of education in fostering stricter compliance, a finding consistent with previous studies [21].

The field survey reinforced these findings, showing no significant difference in dispensing behaviors between urban and semi-rural pharmacies ($p \approx 0.41$), indicating a pervasive issue across regions. However, a significant predominance of positive dispensing responses ($p < 0.001$) underscores the

commonality of this practice that the vast majority of pharmacies in the survey are inclined to dispense antibiotics without a prescription, even if some express reservations (argument) while others do so readily. Such a pronounced difference underscores a potential problem in antibiotic stewardship. Similar patterns have been observed in other regional studies [22]. In the real world, this practice can lead to the misuse of antibiotics, contributing to the growing global concern of antimicrobial resistance. It highlights the need for stricter regulatory measures and enhanced training for pharmacy staff to ensure antibiotics are dispensed only when it is clinically appropriate and under proper supervision.

4.2 Conclusion

In summary, the study reveals that Iraqi pharmacists exhibit a moderate level of compliance in dispensing antibiotics and corticosteroids, marked by high legal awareness but moderate practical adherence. The increased likelihood of non-prescription dispensing among more experienced pharmacists, coupled with the lower frequency among those with advanced degrees, emphasizes the importance of continued professional development. Moreover, external factors such as patient demand and limited healthcare access significantly drive misuse.

To mitigate these issues, a multifaceted approach is recommended. Such measures could bridge the gap between knowledge and practice, ultimately leading to improved medication safety and public health outcomes in Iraq.

CHAPTER 5

Recommendations

Recommendations:

The following recommendations are proposed to address and curb this health crisis within the healthcare community. These strategies aim to improve knowledge, attitudes, and practices among healthcare professionals and the public, tackling the misuse and overprescribing that contribute to issues like antibiotic resistance and other health complications.

Table 4: The recommended strategies aimed to imrpove the misuse of antibiotics and corticosteroids .

STRATEGY	ACTION	DETAIL	PURPUSE
Education and Training	Implement mandatory, comprehensive training programs for all healthcare professionals to enhance their understanding of the appropriate use of antibiotics and corticosteroids.	-Mechanisms and consequences of antibiotic resistance. -Side effects and risks associated with corticosteroid misuse.	Equip healthcare providers with the knowledge and skills needed to shift away from incorrect practices identified in the study
Monitoring and Auditing	Establish a system to track prescribing patterns and conduct regular audits of healthcare practices	- Leverage technology, such as electronic health records, to monitor antibiotic and corticosteroid prescriptions. - Perform periodic audits and provide constructive feedback to healthcare professionals based on findings.	Ensure accountability and adherence to guidelines, addressing deviations from proper administration practices.
Public Awareness	Launch nationwide campaigns to educate the public about the dangers of misusing antibiotics and corticosteroids.	- Utilize multiple media channels (e.g., television, radio, social media) and community events to reach diverse audiences. - Partner with schools and universities to integrate medication safety education into curricula. - Address cultural and social factors that may drive demand for these medications, such as self-medication or pressure on healthcare providers.	Reduce patient-driven demand for unnecessary prescriptions, which may reinforce healthcare professionals' incorrect attitudes.
Collaboration	Form a task force comprising representatives from the Ministry of Health, professional associations, and academic institutions	Work collaboratively to develop and implement a unified strategy to tackle the misuse of antibiotics and corticosteroids.	Foster a coordinated, multi-stakeholder approach to drive systemic change and support the adoption of corrected attitudes and practices.

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Appendix 1 :

Questionnaire: Awareness and Practices on the Misuse of Antibiotics and Corticosteroids in Iraqi Pharmacies

Section 1: Demographics

1. **What is your educational qualification?**
    - a) Bachelor of Pharmacy (BPharm)
    - b) Master's or higher
    - c) Other (please specify

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2. **How many years have you been practicing pharmacy?**
    - a) Less than 5 years
    - b) 5–10 years
    - c) More than 10 years

Section 2: Awareness and Knowledge

3. **Are you aware of the legal regulations regarding dispensing antibiotics and corticosteroids without a prescription in Iraq?**
    - a) Yes
    - b) No
4. **What do you believe are the risks of dispensing antibiotics without a prescription? (Select all that apply)**
    - a) Antibiotic resistance
    - b) Disrupting the natural balance of the gut (killing normal flora)
    - c) Misdiagnosis of the condition
    - d) None of the above
5. **How knowledgeable are you about the potential side effects of corticosteroid misuse (e.g., immunosuppression, hormonal imbalance)?**
    - a) Very knowledgeable

- b) Moderately knowledgeable
- c) Slightly knowledgeable
- d) Not knowledgeable

Section 3: Practices and Challenges

6. **Do you dispense antibiotics or corticosteroids without a prescription?**

   a) Never
   b) Rarely
   c) Sometimes d) Often

7. **If you dispense these medications without a prescription, what are the most common reasons? (Select all that apply)**
   - a) Patient demand
   - b) financial motivations, rewards
   - c) Lack of enforcement of regulations
   - d) Lack of patient access to doctors
   - e) Other (please specify)

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8. **Do you provide counseling (providing guidance, and advice) to patients regarding the proper use and/or side effects of antibiotics and corticosteroids?**
   - a) Always
   - b) Sometimes
   - c) Rarely
   - d) Never

Section 4: Perceptions and Solutions

9. **What do you think are the main barriers to reducing the misuse of these drugs in Iraq? (Select all that apply)**
   - a) Insufficient enforcement of regulations (Weak implementation of laws)
   - b) Lack of pharmacist training

- c) Patient behavior and expectations
- d) Inadequate public health campaigns (Insufficient health awareness initiatives)

10. **What strategies or interventions do you believe are most effective in combating the misuse of antibiotics and corticosteroids? (Select all that apply)**
    - a) Stricter enforcement of prescription-only policies
    - b) better pharmacist education and training
    - c) public awareness campaigns on the risks of misuse
    - d) Improved patient access to healthcare services
    - e) Other (please specify)

