

## Dispensing Antibiotics without Prescription among Palestinian Pharmacists; A Cross-Sectional Study in the West Bank, Palestine

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**Abstract:** Introduction Irrational antibiotic use, due to misuse and overuse, exacerbates antibiotic resistance. Antibiotic dispensing without a medical prescription is highly prevalent among community pharmacies, significantly contributing to antibiotic misapplication. Controlling antibiotic use is critical, as is enforcing relevant laws and regulations. Method: A cross-sectional descriptive study was conducted to identify the factors affecting community pharmacists' practices for dispensing antibiotics without medical prescription and, to determine the prevalence of this dispensing. A standardized questionnaire filled out by community pharmacists (277) from the ten West Bank districts between April - and June 2021 was used to collect the data in a convenient sampling method. The data were analyzed using the SPSS version (19). Results: The findings indicated a high prevalence rate (94.2%) of antibiotic dispensing without medical prescriptions. Amoxicillin was the most commonly dispensed antibiotic, its dispensing rate reached up to (80.64 %). The most common reasons for dispensing the antibiotics without a medical prescription were "the effectiveness of a specific antibiotic (83.8 %)", "patients' inability to see a doctor (58.1%)", and "the lack of adverse effects or complications when administering certain antibiotics' (36.8 %)". While 90.6 % of participating pharmacists were aware of the policy prohibiting dispensing antibiotics without a prescription, 26.4 % opposed it. Recommendation: To prevent antibiotic misuse, officials must enact more restrictions, implement more solutions, and monitor the situation.

**Keywords:** Antibiotics, Community Pharmacists, Medical Prescription, Dispensing, West Bank, Palestine.

### Introduction

The UN Sustainable Development Goals have unequivocally highlighted the crucial need to contain Anti-Microbial Resistance (AMR). Leading global and regional political platforms like G7, G20, and EU, have expressed serious concern about the rapidly emerging problem of AMR and its devastating impact on human development and the global economy. It's imperative that we take immediate and effective action to address this issue and safeguard the health and well-being of our communities and the planet [1].

Antibiotic misuse has been linked to the spread of resistant bacterial strains, according to various epidemiological studies [2, 3,4,5]. Antibiotic misuse can take various forms, including underuse, which is more common in low- and middle-income countries with limited access to healthcare services, unnecessary use, and inappropriate use, where the dose, choice, and duration of therapy are all inappropriate [2,3]. The use of broad-spectrum antibiotics instead of narrow-spectrum antibiotics was estimated to have increased by 35% globally between 2000 and 2010, with low- and middle-income countries responsible for this disproportionate increase. The United States, China, and India, together with South Africa, Brazil, and Russia, are the top six countries with the highest rates of antibiotic use, accounting for 76% of global growth. Penicillin and Cephalosporins comprise 60% of all antibiotics consumed worldwide [3].

The problem is more apparent in undeveloped countries since access to medications without a prescription is simple and easy, resulting in several adverse effects, particularly bacterial resistance [6]. A study in Saudi Arabia established that SM with antibiotics is practiced in the country even though most people know it is inappropriate [7]. Also, several studies demonstrated a high prevalence of SM with antibiotics in many Middle Eastern countries [1,7,8,9].

Despite Palestinian regulations prohibiting the distribution of antibiotics without a medical prescription, Palestinians can obtain antibiotics without a prescription from various sources [10]. Self-medication with antibiotics is a common practice in Palestine, regardless of socioeconomic or educational status, approximately 50% of participants reported self-medication with antibiotics, with a very high use among participants with medical knowledge [11].

This study aimed to determine the prevalence of dispensing antibiotics without a prescription, identify the variables that affect community pharmacists' dispensing of antibiotics without a prescription, and determine the most commonly dispensed antibiotics without a prescription in the West Bank/Palestine.

### Method

A cross-sectional analytical study was conducted from April to June 2021 among 285 community pharmacies using the stratified random sampling method. The sample size was calculated using the Raosoft sample size calculator. The

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pharmacies were selected utilizing the proportional method from each district: Nablus (44), Ramallah (44), Jenin (39), Beit Lahm (24), Hebron (64), Salfit (9), Jericho (5), Jerusalem (25), Qalqilya (13), and Tulkarm (23). The response rate was 97.2% (277). The study used a self-administered questionnaire with two parts. The first part included socio-demographic data, while the second part was used to determine the frequency of antibiotic dispensing without a prescription. To ensure the validity and reliability of the data collection tool, it was examined and translated by experts. In addition, a pilot study was performed involving 10% of the sample population and tested for Cronbach's alpha, which reached a score of 0.904. The study only included community pharmacists with at least a bachelor's degree because pharmacy

assistants, students, and part-time pharmacists are not allowed to dispense medications under Palestinian laws and regulations. The study was approved by the institutional review board at the An Najah National University. Participants accepted the invitation to complete the questionnaire. Finally, data was analyzed using SPSS version 21.

## Results

It's interesting to note that over half of the participants in the study were female, with almost half of them under the age of thirty, and having between one to five years of experience (Table 1).

**Table (1):** Distribution percentage of participants according to their demographic data.

Variable	Category	No.	%
Age	<30	137	49.5
	30 – <40	74	26.7
	40–<50	51	18.4
	≥50	15	5.4
	Total	277	100
Gender	Male	118	42.6
	Female	159	57.4
	Total	277	100
Experience /year	1-5	130	46.9
	5.1-10	58	20.9
	≥10	89	32.1
	Total	277	100
Owner of the pharmacy	Yes	85	30.7
	No	192	69.3
	Total	277	100
Work shift	Morning	118	42.6
	Evening	61	22
	Both	98	35.4
	Total	277	100
District	Jenin	39	14.1
	Nablus	58	20.9
	Ramallah	44	15.9
	Jerusalem	27	9.7
	Hebron	46	16.6
	Beitlahm	22	7.9
	Tulkarm	21	7.6
	Qalqelia	13	4.7
	Jericho	3	1.1
	Salfit	4	1.4
	Total	277	100

The majority of the participants (94.2 %) reported dispensing antibiotics without a medical prescription; with only a small percentage dispensing injection antibiotic (figure 1). The study found that most pharmacists (89.2%) ask patients why they need antibiotics (figure 2), and dispense them mainly to adult patients under 60 years of age (figure 3), with amoxicillin being the most

commonly dispensed antibiotic (figure 4). According to the study results, the majorities of participants' pharmacists (90.6%) are aware that dispensing antibiotics without a prescription is illegal, and most support the policy of not dispensing antibiotics without a prescription.

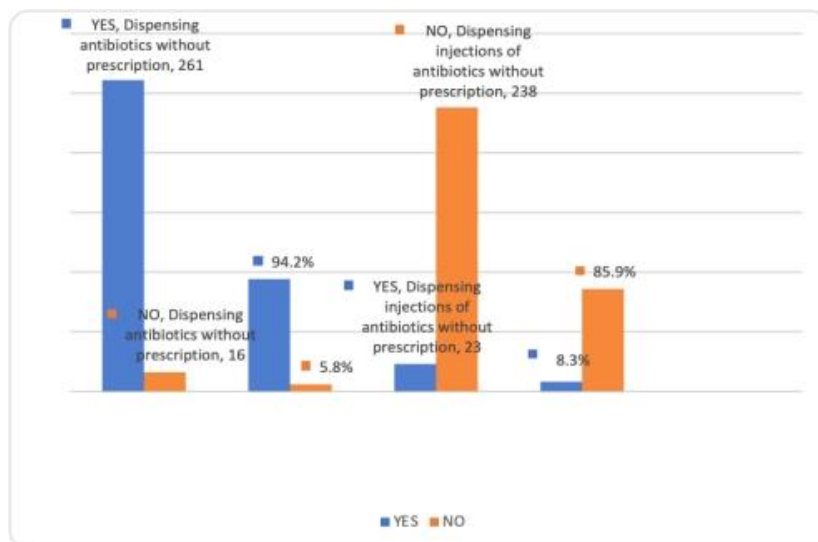


Figure (1): Prevalence of dispensing antibiotics without prescription.

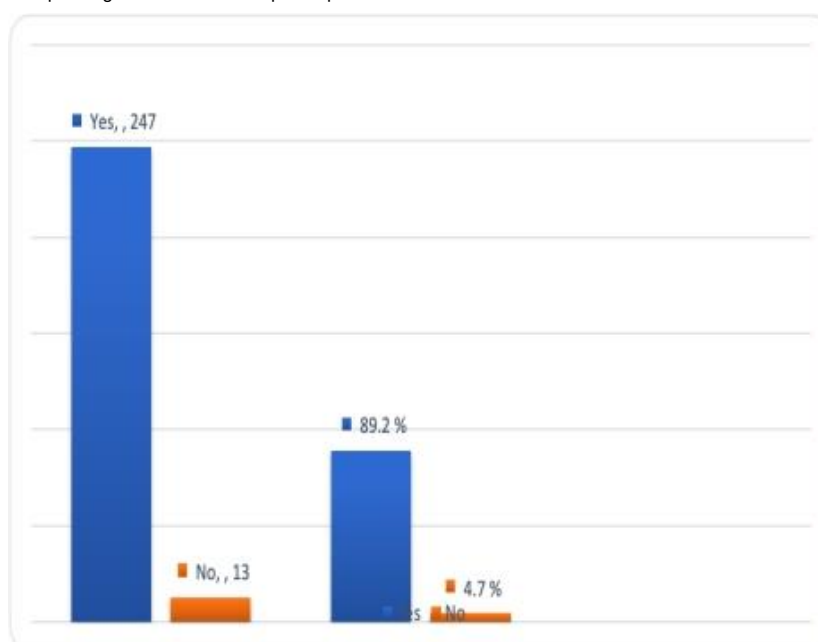


Figure (2): Percentage of pharmacists who ask patients why need antibiotic.

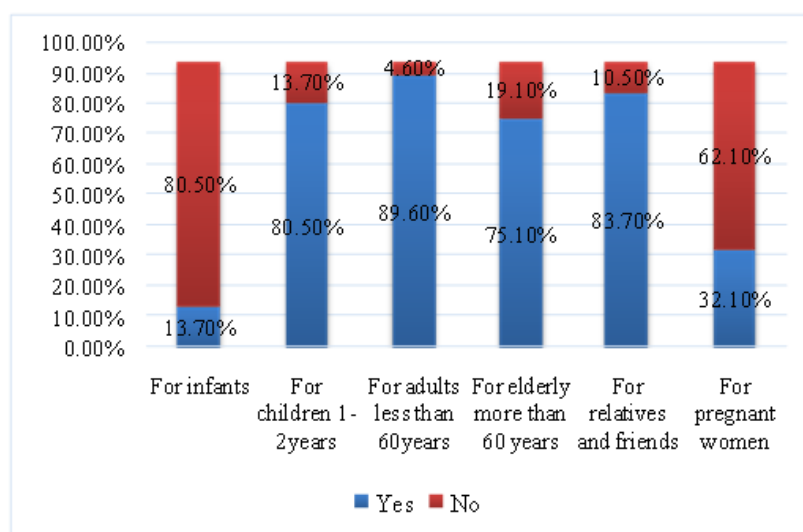
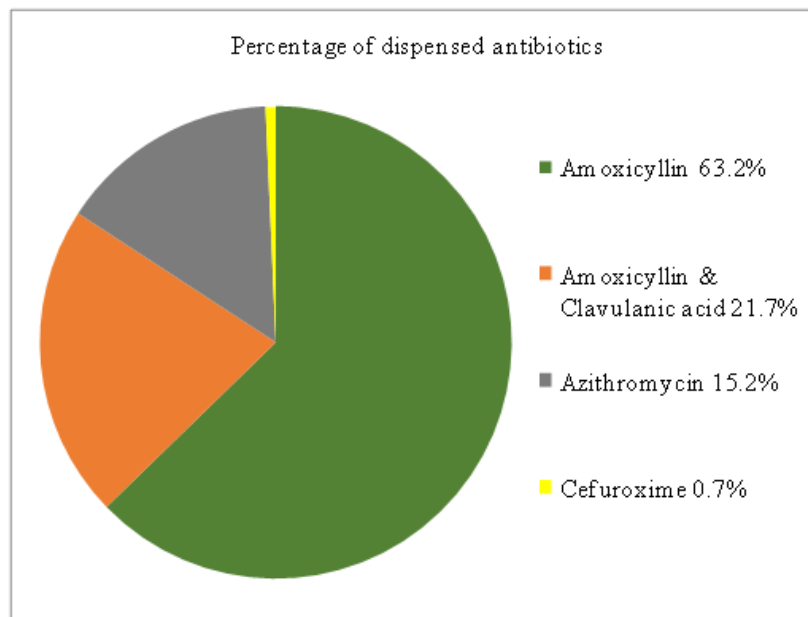


Figure (3): Distribution of percentage of pharmacists who dispense antibiotics according to type of patients.



**Figure (4):** Distribution of percentage of highly dispensed antibiotics without prescription.

**Table (2):** linear regression for factors affecting dispensing of antibiotics without medical prescription.

Mode 2	Un-standardized Coefficients	Standardized Coefficients	t	P.value	Correlations			Co linearity Statistics	
	B	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	1.975		82.92	.000					
Manufacturing company	-.181	-.419	-15.78	.000	-.809	-.696	-.226	.292	3.430
Antibiotic efficiency	-.205	-.352	-16.90	.000	-.648	-.720	-.243	.475	2.107
Company sales and bonus	-.100	-.218	-6.38	.000	-.883	-.365	-.092	.176	5.673
Antibiotic expiry date	.009	.019	.583	.560	-.851	.036	.008	.189	5.295
Patients' inability to visit a doctor	-.020	-.048	-2.46	.014	-.564	-.150	-.035	.546	1.831
Financial and economic reason	-.048	-.111	-4.01	.000	-.822	-.240	-.058	.271	3.690
Keeping customers	-.032	-.078	-3.36	.001	-.726	-.203	-.048	.386	2.589
knowing about the policy of dispensing antibiotic without prescription	.007	.009	.60	.545	.079	.037	.009	.965	1.036
pharmacists support policy	-.014	-.026	-1.73	.085	-.148	-.106	-.025	.926	1.080

Based on the data presented in (Table 2) it has been observed that several variables were found to be significant predictors. Interestingly, the partial coefficient of some of these predictors was close to zero, indicating the possibility of their being influenced by other variables. The study also showed that the decision-making process of community pharmacists in dispensing antibiotics is complex and influenced by various factors such as the patient's inability to visit doctors, keeping customers, manufacturing companies, sales, and bonuses.

## Discussion

Antibiotic dispensing without a prescription is a complex issue influenced by various factors. A comprehensive review study of Southern Thai community pharmacists found that high patient demand was not statistically significant in administering antibiotics without a prescription [12]. Similarly, other studies in Sri Lanka found no significant relationship between patient demands and antibiotic dispensing without a prescription [13]. Conversely, a statistically significant relationship ( $P < 0.001$ ) was found between the act of dispensing antibiotics without a prescription and the pharmacist's fear that the patient might

obtain the antibiotic from another pharmacy if not dispensed [14]. These results were consistent with a study conducted in the north of Spain (Table 2). Another investigation conducted in Sri Lanka found a statistically significant correlation ( $p\text{-value} = 0.003$ ) between pharmacists' knowledge of the legal elements of antibiotic use and their administration of antibiotics without a prescription [13]. Pharmacists' constant pursuit of increased remuneration is a known phenomenon. However, this study demonstrates a significant relationship between the dispensing of antibiotics without a prescription and sales and bonuses on pharmaceuticals (Table 2). Three distinct qualitative investigations conducted in Iraq, India, and Syria found that distributing antibiotics without a prescription was associated with economic benefits for pharmacists [15]. Nonetheless, the significance of these findings has not been verified. Pharmacies consider pharmaceutical companies when selecting which antibiotics to dispense without a prescription. Some pharmacists feel that certain medications from a particular company are more efficient than others. Pharmaceutical companies also view pharmacists as a crucial component in their profit-making process and may offer those incentives or even a percentage of

their profits. However, given the increased likelihood of developing resistance when antibiotics are used incorrectly, the profit and loss approach should not be applied to the topic of antibiotics. According to this study, there is a strong correlation between manufacturing businesses and the distribution of antibiotics without a prescription (Table 2). Several studies in Malaysia, Thailand, Pakistan, Bangladesh, India, and Saudi Arabia have demonstrated a correlation between the distribution of antibiotics without a prescription and financial incentives from pharmaceutical corporations or business owners [15]. The same study pointed to results from Iraq, India, and Syria found that dispensing antibiotics without prescription was correlated with economic benefit for pharmacists, but without statistical significance [15]. In a study from Mozambique, pharmacy owners' pressure to make a profit and the need for a salary income led to dispensing antibiotics without prescriptions [16]. However, a qualitative finding from Nepal showed no association between revenue and profit and dispensing antibiotics without prescription [17]. Pharmacists may dispense antibiotics without prescription due to their efficacy in treating bacterial infections, especially if they have been used before. This study has shown a significant correlation between dispensing antibiotics without prescription and the antibiotic's efficiency. All participating pharmacists in a previous study from Iraq dispensed antibiotics without prescription because of their efficiency in treating bacterial infections [18]. Another study from Mozambique showed a relationship between dispensing antibiotics without a prescription and pharmacists' beliefs in their curative effect [16]. Pharmacists work according to the First Out principle, which is to reduce the risk of nearly expired medications. This study has shown a significant correlation between dispensing antibiotics without prescription and antibiotic expiry date (Table 2). However, a qualitative study in India showed no correlation between dispensing antibiotics without a prescription and near-expired antibiotics [19].

I agree that preventing inappropriate antibiotic use and overuse is crucial. Policymakers should take various measures and follow-up to restrict the dispensation of antibiotics without a prescription. Ongoing education programs can help raise awareness among pharmacists, and mandating that doctors write prescriptions with the scientific name can prevent errors and overuse. However, it is essential to conduct further research to identify the root cause of antibiotic overuse despite current regulations that prohibit unjustified prescription. The issue of dispensing antibiotics without a prescription is multifaceted and requires careful consideration from all stakeholders. Addressing the underlying factors that lead to this practice can help ensure the safe and appropriate use of antibiotics, which is critical for protecting public health.

To avoid inappropriate antibiotic misuse and overuse, policymakers should consider implementing more regulations, multiple strategies, and follow-up procedures. We need to increase pharmacists' awareness through continuous education programs and strengthen the existing laws that prevent prescribing antibiotics without a prescription. Further studies are required to determine the reasons behind the overuse of non-prescribed antibiotics. Forcing physicians to write prescriptions with the scientific name will reduce the misuse and overuse of antibiotics.

## Conclusion

It's encouraging to see that the study recognizes the complexity of the decision-making process of community pharmacists in dispensing antibiotics. By acknowledging the various factors that influence their decisions, we can work towards developing strategies that prioritize patient health and

well-being while promoting responsible use of antibiotics. This can have a positive impact on patient outcomes and contribute to improving overall public health, which is crucial in the fight against antibiotic resistance.

## Disclosure Statement

- **Ethics approval and consent to participate:** The official ethical approval was granted by the Institutional Review Board at An-Najah National University in Palestine, with reference number Mas: Feb: 2020/35 (Archived No. 35). Additionally, a consent form was used to ensure that community pharmacists agreed to participate in the study
- **Consent for publication:** Not Applicable
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