

SELF-ASSESSMENT OF PHARMACISTS REGARDING THE PRACTICE OF DISPENSING ANTIBIOTICS IN PUBLIC PHARMACIES

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Summary: Introduction: Approximately at the end of one century after the discovery of penicillin, the world is facing the development of bacterial resistance to antibiotics. The focus of our work is the pharmacist, as one of the key actors in the chain of antibiotic dispensing. Through research, we aimed to determine the level of knowledge among employees in pharmacies in the city and municipality of Šabac in the Republic of Serbia about antibiotics, antimicrobial resistance, the legal framework regulating the area of antibiotic dispensing, as important factors for self-assessment in the practice of antibiotic dispensing in public pharmacies. **Objectives:** (1) to examine the knowledge of pharmacy employees about antibiotics, antimicrobial resistance (AMR), and the legal framework regulating the area of antibiotic dispensing; (2) to investigate the practice of antibiotic dispensing in public pharmacies; (3) to assess differences in the practice of antibiotic dispensing based on gender of the respondents, pharmacy location, and level of education. **Methodology:** A cross-sectional study was conducted using a purposefully created questionnaire consisting of 33 questions, through which respondents self-assessed their knowledge related to antibiotics and the practice of antibiotic dispensing in the last six months. Health workers of all levels of pharmacy education employed in almost all pharmacies in the territory of the city of Šabac (including city and rural pharmacies) participated in the study. Data were collected from March to August 2022. **Results:** The total number of respondents in the study was 229, with the majority being female. Regarding formal education, the majority of respondents were graduate pharmacists (59%), followed by higher pharmacy technicians (3.5%) and pharmacy technicians (37.6%). When it comes to viral infections, 95.2% of respondents knew that antibiotics are ineffective in such cases; while 72.6% of respondents believe that acute sore throat should not be treated with antibiotics. As much as 99.6% of respondents confirmed the statement that inappropriate use of antibiotics contributes to the increase in antibiotic resistance. Also, 96.5% of respondents confirmed that dispensing antibiotics without a prescription leads to the development of antibiotic resistance. A total of 90.8% of respondents are aware that pharmacists can be penalized in accordance with existing legal regulations if they dispense antibiotics without a prescription. In practice, dispensing antibiotics without a prescription is still present in certain situations. Although this phenomenon is not common based on survey responses ("I always prescribe without a prescription at the patient's request") for the surveyed locations of infections, it occurs in a small number of cases, from 1.4% to 4.0%. However, based on the response "I sometimes prescribe without a prescription at the patient's request," it occurs more frequently in certain clinical conditions and complaints: most commonly urinary tract infections in 52% of cases, infected wounds - 42.4%, acute sore throats in 29.8%, and diarrhea - 15.7%, and least commonly for common colds and coughs in 9.2%. At the patient's request, the majority of respondents - 79.9% never dispense antibiotics without a prescription, but still globally 20.1% of respondents sometimes dispense antibiotics without a prescription or doctor's report. **Conclusion:** Based on the results of the sample of 229 pharmacist and pharmacy technician respondents, it is concluded that dispensing antibiotics without a prescription is still present in practice in certain situations. Although this phenomenon is not common from responses: "I always prescribe without a prescription at the patient's request" for surveyed locations of infections (1.4% to 4.0%), and sometimes for certain conditions and complaints, most commonly for common colds and coughs at 9.2% and most commonly for urinary tract infections - 52%, At the patient's request, 79.9% of respondents never dispense antibiotics without a prescription, but still globally 20.1% of respondents sometimes dispense antibiotics without a prescription or doctor's report. Antimicrobial resistance is a systemic issue that undoubtedly requires teamwork of all stakeholders in society where the role of pharmacists and pharmacy technicians is one of the most significant.

Keywords: antibiotics, antibiotic resistance, pharmacists, antibiotic dispensing in public pharmacies.

INTRODUCTION

Antibiotics are becoming increasingly ineffective as drug resistance spreads globally, leading to more severe infections and increased mortality. Considering that several decades have passed since the beginning of mass antibiotic use, the development of bacterial resistance to antibiotics is an expected process of evolution in terms of bacterial genetic adaptations to environmental conditions. With the understanding that the number of bacteria doubles every 20 minutes, it becomes clear how significant the possibilities for resistance development are. Bacterial resistance to antibiotics today poses one of the greatest threats to global health [1]. While resistance to antibiotics occurs naturally, irrational antibiotic use accelerates this process, resulting in increased mortality, prolonged hospital stays, and higher medical costs. According to antibiotic consumption data, the Republic of Serbia ranks high among European countries, while a high level of resistance is observed in all tested bacterial species in our country, similar to countries in Southern and Eastern Europe [2]. Mass antibiotic use has led to a significant problem of antimicrobial resistance (AMR) over time. AMR was initially addressed by the development of new classes of antimicrobial agents and chemical modification of existing ones. However, the development of new antimicrobial drugs has not kept pace with the ability of microbes to develop resistance. As a result, AMR is now a global public health challenge and an escalating threat to infectious disease control worldwide. AMR results in prolonged illness, increased risk of infection spread, increased morbidity, and higher mortality rates, with associated increases in financial and societal costs [3].

At the global level, the World Health Organization (WHO) as the coordinating body for global public health, recognizing the problem of irrational use of antibiotics and their increasing inefficacy, has initiated specific actions among United Nations member countries on this issue. At the World Health Assembly meeting in 2015 dedicated to the development and implementation of multisectoral national action plans, member countries committed to a framework presented in the Global Action Plan (GAP) on antimicrobial resistance (AMR) in 2015. This plan was later endorsed by the United Nations Food and Agriculture Organization (FAO) and the World Organisation for Animal Health (OIE) [4]. Immediately after the adoption of GAP to address AMR, the International Pharmaceutical Federation (FIP) released a document in 2015 titled "Fighting Antimicrobial Resistance: The Contribution of Pharmacists." This informative document outlined various activities involving pharmacists aimed at preventing AMR and slowing down its progression. The reason for creating such a document lies in the unique position of pharmacists in healthcare systems, making them the most accessible healthcare professionals and thus indispensable in addressing the issue of AMR. FIP continues its efforts to combat AMR in line with action plans extending up to 2030 [5]. In accordance with initiatives by the United Nations, the World Health Organization, the European Centre for Disease Prevention and Control, the International Pharmaceutical Federation, and other relevant international health institutions, since November 2015, the Ministry of Health of the Republic of Serbia has joined global efforts to combat antimicrobial resistance and promote rational antibiotic use. The Ministry of Health formed a Working Group to develop a national guide for good clinical practice in rational antibiotic use to create a comprehensive, evidence-based, and practical guide. The national guide for good clinical practice aims to motivate healthcare workers to incorporate evidence-based recommendations into their daily practice, thus contributing to improving the quality and safety of patient care in the healthcare system of the Republic of Serbia [6]. Shortly thereafter, on February 7, 2019, the Government of the Republic of Serbia issued a Regulation on the National Program for Controlling Antibiotic Resistance [7]. Over the past few years, the state has implemented various organized measures, primarily involving the education of healthcare professionals, media campaigns to raise awareness about the importance of rational antibiotic use and the threat of antimicrobial resistance among healthcare workers and the general population, strengthening the capacity of microbiological laboratories, and developing strategic documents, among others. However, assessing the effects of all these measures remains challenging [8].

Pharmacists' awareness of antimicrobial resistance (AMR) issues and rational antibiotic use is annually emphasized during the World Antimicrobial Awareness Week, which is part of a global campaign aimed at increasing awareness and understanding of AMR. This week is observed from November 18th to 24th and encourages best practices in the public and urges all key stakeholders to take action to reduce the further emergence and spread of AMR [9]. This day is also marked in our country, notably on November 18th, as the European Antibiotic Awareness Day, with a similar goal of drawing attention of professionals and the public to the threat posed to public health by bacterial resistance to antimicrobial

drugs and increasing awareness of the need for rational antibiotic use. All these measures have significantly raised awareness among pharmacists in recent years.

Ultimately, it's worth noting that important factors influencing pharmacists' self-assessment in antibiotic dispensing practices include individual levels of pharmacist knowledge, inspection supervision, lack of time to dedicate to each patient individually, profit motives, "incentivizing" rewards, knowledge of legal regulations, personal attributes, and others.

OBJECTIVES

The specialist work from which this text originated set three specific objectives that the conducted research needed to address:

1. Investigate general knowledge about antibiotics, antimicrobial resistance (AMR), and legal frameworks among healthcare workers employed in pharmacies (pharmacists and pharmacy technicians).
2. Examine the practice of dispensing antibiotics in specific situations (such as viral infections, sore throat, colds, urinary tract infections, infected wounds, and other conditions) in public pharmacies (both state-owned and private).
3. Evaluate differences in the practice of dispensing antibiotics based on the gender of the respondents, the location of the pharmacy, and the level of education.

As a general goal, the work aimed to empirically present the self-assessment of pharmacists regarding the practice of dispensing antibiotics in public pharmacies.

THE METHODOLOGY

The study was conducted as a cross-sectional study using a purpose-designed questionnaire through which respondents self-assessed their knowledge related to antibiotics and their practices in dispensing antibiotics over the past six months. The research involved healthcare workers of all levels of pharmacy education (pharmacists, pharmacy masters, graduates, technicians) employed in almost all pharmacies in the city of Šabac (including both urban and rural pharmacies). Additionally, participants attending the XV Professional Conference "Marketing in Pharmacy," held in Šabac on March 19, 2022, under the theme "New Knowledge, Skills, and Competencies of Healthcare Workers - Challenges in the 21st Century," organized by the Pharmacy Institution "Melissa" and the drugstore "Lin" from Šabac, were also included in the study. Data were collected from March to August 2022.

The collected data were analyzed using the statistical program SPSS, employing descriptive analysis (frequencies, mean values, and standard deviations). To assess the existence of statistically significant differences in the prevalence of certain socio-demographic characteristics and knowledge indicators, the Pearson Chi-square test (χ^2) was utilized. Mean values and dispersion parameters proven to originate from populations with normal distribution were presented as mean values \pm standard deviations.

The questionnaire was created for the purposes of this specialist work, mostly through modification of the questionnaire used in Ana Balać's specialist work [10]. An expert panel consisting of four experts (two pharmacy masters with over 20 years of experience in pharmacy practice, and two university professors experienced in pharmaceutical practice research) additionally adapted the questionnaire based on changes in practice that occurred between the previous research and the current study, particularly regarding antibiotic dispensing in the Republic of Serbia. Furthermore, limitations identified in previous research, the National Guide for Good Clinical Practice for Rational Antibiotic Use, and the original research by Shukry Zawahir et al. served as references for creating the initial version of the questionnaire based on Ana Balać's research.

The questionnaire used in the study consisted of three sections:

Section 1: Knowledge related to antibiotics;

Section 2: Practices in dispensing antibiotics over the past six months;

Section 3: Socio-demographic data.

RESULTS

During the research, a total of 400 questionnaires were distributed to respondents. As the completion of the questionnaires was based on a voluntary principle, out of the total number of distributed questionnaires, 258 were completed, with 29 not fully filled out. Therefore, the total number

of respondents who completed the questionnaire in a qualitatively satisfactory manner for use in the research was 229, or 88.76% of the total number of completed questionnaires. Looking at the gender structure of the questionnaires used in the study, 200 respondents were female (87.3%). In terms of formal education, the majority of respondents were individuals with a completed pharmacy faculty degree – pharmacists (59%), followed by higher pharmacy technicians (3.5%) and pharmacy technicians (37.6%). The research showed that the minimum number of pharmacists per pharmacy was one, while the maximum was six. More than half of the pharmacies had two employed graduated pharmacists (57%). Almost all pharmacists in pharmacies had a license to practice (98.6%), with only 3 respondents indicating that not all pharmacists in their pharmacies were licensed. The average age of the respondents was 40.1 years, and the average years of work experience were 14.4 years. Most respondents worked in city pharmacies (47.6%), followed by pharmacies in smaller towns (39.2%), while the smallest number worked in rural pharmacies (13.2%).

Results related to knowledge about antibiotics:

Respondents answered 33 questions from the questionnaire, and the results of the survey show that only 37.1% of respondents know that antibiotics are substances that can kill or inhibit the growth of bacteria, while 63.9% believe that antibiotics act not only on bacteria but also on other microorganisms (fungi, viruses, and parasites). When it comes to viral infections, 95.2% of respondents know that antibiotics are ineffective in that case; 98.7% of respondents are sure that common colds and coughs should not be treated with antibiotics, while 72.6% of respondents believe that acute sore throat should not be treated with antibiotics. The vast majority of respondents correctly answered that bacterial infections are treated with antibiotics (96.9%), while 97.4% of respondents are aware that antibiotics will be less effective in the future if used frequently.

Antibiotic resistance is a significant and widespread problem worldwide, with the majority of respondents (96.5%) agreeing with this statement. Regarding the assertion that the voluntary use of antibiotics is one of the causes of resistance, 98.7% of respondents confirmed this.

More than 90% of respondents answered affirmatively to the following questions:

- Inappropriate use of antibiotics contributes to the increase in antibiotic resistance (99.6%).
- Issuing antibiotics without a prescription will lead to the development of antibiotic resistance (96.5%).
- One of the causes of antibiotic resistance is that patients do not adhere to prescribed antibiotic regimens (94.3%).

Regarding the statement that one of the causes of resistance is discontinuation of antibiotic use before completing the therapeutic regimen, 86.5% of respondents confirmed this, while 50.2% of respondents also confirmed that the use of antibiotics at a dose higher than prescribed is one of the causes of resistance.

A very small number of respondents (11.8%) responded that there are antibiotics in Serbia that can be dispensed without a prescription, but the majority are aware of regulations stating that pharmacists in Serbia cannot legally dispense antibiotics (95.6%), and that pharmacists can be punished if they dispense antibiotics without a prescription (90.8%).

The overall knowledge score ranged from 18 to 31, meaning that none of the respondents had a maximum score of 33. The average knowledge score for the total sample was 26.26 ± 2.92 .

Results related to the practice of antibiotic dispensing in the last six months

Responses to questions regarding the dispensing of antibiotics without a prescription are as follows:

- Upon patient request, 79.9% of respondents NEVER dispense antibiotics without a prescription.
- For adult patients with symptoms of viral infection, 97.8% of respondents NEVER dispense antibiotics without a prescription.
- For children with symptoms of viral infection, 99.1% of respondents NEVER dispense antibiotics without a prescription.
- For adult patients with mild symptoms caused by bacterial infection, 82.1% of respondents NEVER dispense antibiotics without a prescription.
- For children with symptoms of bacterial infection, 86.9% of respondents NEVER dispense antibiotics without a prescription.
- If they know the patient, 69.9% of respondents NEVER dispense antibiotics without a prescription.

Whether respondents require prescriptions from doctors to be original or photocopied is shown in the following table (Table 1).

Table 1 - Distribution of responses regarding whether prescriptions from doctors should be original or photocopied

Issuing antibiotics prescribed on a doctor's report (e.g., specialists from a hospital institution)	number of respondents	percentage of respondents
original prescription	150	65,5%
photocopied prescription	34	15%

Responses to the question of whether antibiotics were dispensed without a prescription for specific conditions in the past month are presented in Table 2. Although this occurrence is rare based on the response "I always (100%) prescribe without a prescription at the patient's request," for the examined infection localizations, it was rare for the urinary tract - ranging from 1.3% to 4.0% for common cold and cough or diarrhea. However, based on survey responses: "I sometimes dispense antibiotics without a prescription (in a range of 25-75% of cases) for certain conditions i.e. infection localizations, this happens (most often in urinary tract infections - 52.0%, infected wounds - 42.4%, acute throat inflammation 29.8%, and diarrhea - 15.7%, and least often in common cold and cough - 9.2%. Despite the fact that the highest number - 79.9% of respondents never dispense antibiotics without a prescription at the patient's request, still 20.1% of respondents sometimes dispense antibiotics without a prescription or doctor's report.

Table 2 - Distribution of responses to questions about whether respondents dispensed antibiotics without a prescription during the past month for the specified conditions, symptoms, or localization of potential infection

Conditions/Symptoms	NEVER 0%	25%	50%	75%	ALWAYS 100%	I DON'T KNOW
Acute sore throat	70,2 %	18%	6,1%	3,9%		1,8%
Common cold and cough	90,8%	5,7%	1,3%	4%	4%	1,3%
Infected wound	57,6%	21%	10,9%	5,7%	2,2%	2,6%
Urinary tract infections	48%	28,4%	17%	3,5%	1,3%	1,7%
Diarrhea	81,7%	13,5%	2,2%		4%	2,2%

Results regarding the practice of antibiotic dispensing concerning participants' gender, pharmacy location, and educational level

To address one of the objectives of this study, which pertains to assessing differences in antibiotic dispensing practices based on participants' gender, pharmacy location, and educational level, we analyzed the data obtained from the study precisely based on these socio-demographic characteristics (Table 3).

Table 3 - Responses regarding gender, educational level, and pharmacy location

Statement	Gender	Education level	Pharmacy location
	<i>X² (Df); p value</i>		
"I dispense antibiotics without a prescription if the patient requests it."	0,391(2); p=0,822	1,852(4); p=0,763	6,701(4); p=0,153
"I dispense antibiotics without a prescription to adult patients with mild symptoms due to viral infections."	8,276(2); p=0,016	2,513(4); p=0,642	2,907(4); p=0,574
"I dispense antibiotics without a prescription to children with symptoms of viral infection."	0,293(1); p=0,589	1,405(2); p=0,495	2,223(2); p=0,329
"I dispense antibiotics without a prescription to children with symptoms of bacterial infection."	0,415(2); p=0,813	2,755(4); p=0,600	7,772(4); p=0,100
"I dispense antibiotics without a prescription if I know the patient and upon their request."	0,352(2); p=0,838	1,663(4); p=0,797	11,608(4); p=0,021
"I dispense antibiotics without a prescription to adult patients with mild symptoms caused by bacterial infections."	0,293(2); p=0,864	3,525(4); p=0,474	7,188(4); p=0,126
"When dispensing antibiotics prescribed once, I return the prescription/order/form with a facsimile of the doctor's signature to the patient."	3,015(2); p=0,221	4,130(4); p=0,389	5,110(4); p=0,276
"When dispensing antibiotics on a paper prescription/order/form, I record the issuance on the paper prescription/order/form by affixing my signature, date, and the number of boxes dispensed."	2,047(2); p=0,359	8,166(4); p=0,086	6,467(4); p=0,167
"When dispensing antibiotics prescribed on a physician's report (specialist from a hospital institution), I document what was dispensed on the report and authenticate that record with a stamp."	1,068(2); p=0,586	10,028(4); p=0,040	2,469(4); p=0,650
"When dispensing antibiotics prescribed on a physician's report (e.g., specialist from a hospital institution), I request that the report be original."	2,452(2); p=0,293	0,296(4); p=0,990	1,762(4); p=0,779
"When dispensing antibiotics prescribed on a physician's report (e.g., specialist from a hospital institution), I request that the report be photocopied."	0,584(2); p=0,747	6,572(4); p=0,160	3,086(4); p=0,544
"When dispensing antibiotics on a paper prescription/order/form, I document the dispensing (with my signature, date, and the number of boxes dispensed) and stamp the pharmacy's seal on the paper prescription/order/form."	4,757(2); p=0,093	2,298(4); p=0,681	5,851(4); p=0,211
"I make photocopies of the reports/prescriptions/orders for which antibiotics are prescribed but not retained, and I keep copies in the pharmacy."	0,652(2); p=0,722	3,671(4); p=0,452	2,576(4); p=0,631

The results we obtained show that in terms of gender, there is a statistically significant difference in responses only for the statement "I issue antibiotics without prescription to adult patients with mild symptoms due to viral infections." 6.9% of male respondents answered "sometimes," while only 0.5% of female respondents did so. A statistically significant difference in education level is observed for the statement "When issuing antibiotics prescribed by a hospital specialist, I document what was issued on the report and stamp that record with a seal." The response "always" was given by the majority of pharmacists (83.7%), followed by higher pharmacy technicians (75%), and then pharmacy technicians (68.6%). Although only licensed pharmacists are legally allowed to dispense prescription drugs, it is evident in practice that pharmacy technicians also dispense drugs because a high percentage of them responded positively to this question. Every pharmacy must have a responsible pharmacist present, and only in their presence can a pharmacy technician dispense medication. Personal connections with patients, the so-called "patient-oriented care" concerning the location of the pharmacy, is represented by the statement "I issue antibiotics without prescription if I know the patient, upon their request," and it is the only one that statistically differs in responses. Employees in pharmacies in smaller locations predominantly responded with "never" (79.8%).

DISCUSSION

If this study from Sri Lanka from 2016/17 is compared with our research from 2022, several important observations can be made. Firstly, the study from Sri Lanka had a national character, considering that the survey was conducted across all provinces of the country, while our research focused on one (micro)region (the city of Šabac and its surroundings). Furthermore, antibiotics are still dispensed without a prescription in both countries, despite legislative frameworks prohibiting it; the knowledge of pharmacy staff on the topic of antibiotics, AMR, and antibiotic dispensing practices is significantly better in the Republic of Serbia; knowledge about antibiotics is one of the reasons that significantly influences the reduction of antibiotic dispensing without a prescription, therefore, further education and raising awareness about these issues in both countries are recommended; the level of formal education of employees in the Republic of Serbia is higher than that of their colleagues in Sri Lanka; personal acquaintance with patients in both countries is a major reason for dispensing antibiotics without a prescription; the profit motive is extremely significant in both countries. Finally, awareness of AMR and its harmful impact on the entire population cannot be left as a problem only for pharmacy employees and patients. The significance of this issue is such that it requires the activation of the entire society, from the governments of all countries (including Sri Lanka and the Republic of Serbia), which will incorporate this topic into public health policies, to a broad action by media professionals to spread awareness about these issues, revising educational programs, improving educational plans for personnel being trained for pharmaceutical activities, and other measures.

Regarding the Republic of Serbia, Ana Balać, a specialist at the Faculty of Pharmacy, University of Belgrade, defended her specialist paper titled "The Use of Antibiotics: Beliefs, Knowledge, and Experiences of Pharmacists and Pharmacy Technicians" in 2020. For her paper, she conducted research on the use of antibiotics, which covered the knowledge and experiences of pharmacists and pharmacy technicians on this topic. Comparing her research with ours, which has a time difference of three years, we conclude that respondents possess relatively good knowledge about antibiotics and AMR. Both studies aimed to raise awareness among pharmacists and pharmacy technicians about their role in antibiotic dispensing and the fight against AMR [10].

The most important factors related to the practice of dispensing antibiotics in this study are the level of education, personal knowledge, experience, keeping up with developments in pharmaceutical activities, personal connections with patients, and the so-called "patient satisfaction." What could not be precisely examined through this questionnaire is the well-known tendency for profit and the approval (or encouragement) of certain practices by pharmacy owners. Along with these phenomena, there is invariably weak inspection supervision of the legal regulations defining this area.

CONCLUSION

Self-assessment of pharmacists regarding the practice of dispensing antibiotics in public pharmacies in the city and municipality of Šabac in the Republic of Serbia was examined through responses to 33 self-assessment questions from the completed questionnaire. The results of the study

show that regarding viral infections, 95.2% of respondents know that antibiotics are ineffective in such cases; 98.7% of respondents are confident that common colds and coughs should not be treated with antibiotics, while 72.6% of respondents believe that acute throat pain should not be treated with antibiotics. However, there is a lower level of knowledge about the mechanism of action of antibiotics. Only 37.1% of respondents know that antibiotics are substances that can kill bacteria (bactericidal antibiotics) or prevent the growth of bacteria (bacteriostatic). Respondents have shown a fairly good level of knowledge about antibiotics and antimicrobial resistance (AMR) and legal frameworks.

However, despite the good level of theoretical knowledge and relatively good legal framework, based on the results from the sample of 229 pharmacists and pharmacy technicians, we conclude that the practice of dispensing antibiotics without a prescription still persists in certain situations. Although this phenomenon is not common based on the survey response "I always prescribe without a prescription at the patient's request" for the examined localizations of infections, it occurs in a small number of cases (1.4% to 4.0%). However, based on the response "I sometimes prescribe without a prescription at the patient's request," it happens more often in certain clinical conditions and complaints: most commonly urinary tract infections in 52% of cases, infected wounds in 42.4%, acute throat inflammation in 29.8%, and diarrhea in 15.7%, and least commonly in common colds and coughs in 9.2%. At the patient's request, the majority of respondents - 79.9% never dispense antibiotics without a prescription, but globally, 20.1% of respondents sometimes dispense antibiotics without a prescription or doctor's report. The most important factors related to the practice of dispensing antibiotics in this study are the level of education, personal knowledge, experience, keeping up with developments in pharmaceutical activities, personal connections with patients, and the so-called "patient satisfaction." Specific "circumstances" that must be taken into account are also of exceptional importance, as the statement "I prescribe antibiotics without a prescription if I know the patient, at his request..." is the only one that statistically differs in responses. Employees in pharmacies in smaller towns mostly indicated "never" (79.8%). The significance of higher education is shown in the response to the question "When dispensing antibiotics prescribed on a doctor's report, I record what was issued on the report and stamp the record," statistically significantly more pharmacists (83.7%; $p=0.040$) do it always, while pharmacy technicians do it sometimes (68.6%). Like all problems, the issue of antimicrobial resistance (AMR) is a systemic one, which undoubtedly requires teamwork of all stakeholders in a society where the role of pharmacists and pharmacy technicians is one of the most significant.

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