

Knowledge, Attitude and Practice of Community Pharmacists Regarding Antibiotic use and Infectious Diseases.

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Introduction

The efficient treatment of infectious illnesses is seriously threatened by the worldwide health issue of antibiotic resistance (Conly & Johnston, 2005; Gottlieb & Nimmo, 2011). In the end, this phenomena raises morbidity and mortality by increasing the use of resources, increasing clinical and financial burdens, and increasing the usage of broad-spectrum antibiotics (Collignon & McEwen, 2019). Human activity, especially the overuse and improper use of antibiotics in healthcare systems, has a significant impact on the spread of resistant bacteria (Jinks et al., 2016). The issue is made worse by inappropriate antibiotic usage, which frequently results from self-medication and the needless treatment of viral illnesses (Friedman, Temkin, & Carmeli, 2016).

Due of their accessibility, community pharmacists (CPs) are the initial point of contact for people looking for pharmaceutical and medical services.

Reduced expenses and faster wait times. However, the availability of antibiotics in community pharmacies has led to a worrying increase in the non-prescription use of antibiotics in poor nations (Sabtu, Enoch, & Brown, 2015). Evidence suggests that CPs frequently fail to encourage the proper and rational use of antibiotics, and estimates from throughout the world indicate that more than 50% of antibiotics are obtained without a prescription (Franco et al., 2009).

Working with a community pharmacist is usually necessary to obtain antibiotics without a prescription. This technique is especially common in nations with low and moderate incomes. Community pharmacists are responsible for addressing this issue by improving understanding and changing public attitudes about the use of antibiotics. Stressing the importance of pharmacists as essential providers as well as community regulators of antibiotics (The Role of the Pharmacist in the Health Care System, n.d.).

Healthcare systems must use Antimicrobial Stewardship Programs (ASPs) to fight antibiotic resistance. By encouraging the prudent use of antibiotics and lowering antibiotic resistance, CPs can be extremely important in these initiatives. To help combat antibiotic resistance, CPs should take an active part in ASPs as members of the medical community.

Information about community pharmacists' knowledge, attitudes, and behaviors regarding antibiotic usage, resistance, and ASPs is scarce. Since antibiotic resistance is a global issue, this study attempts to close this knowledge gap and offer insightful information to pharmacists and the pharmacy community worldwide. It is essential that CPs encourage Even in times of global health emergencies, CPs must encourage the prudent use of antibiotics in order to stop the spread of germs that are resistant to them.

Aims and Objectives

To assess community pharmacists' knowledge, attitudes, and practices related to antibiotic use and infectious diseases.

Literature Review

Antibiotic effectiveness has been declining since the late 20th century (Gaynes, 2017; Aminov, 2010). This trend is ascribed to a declining supply of novel antibiotics, particularly those appropriate for primary care (Gajdacs, 2019; Gajdacs & Albericio, 2019), as well as the quick rise of antibiotic-resistant

(AB-resistant) bacteria, notably among Gram-negatives (Exner et al., 2017). As a result, doctors now have fewer treatment choices to choose from (Laxminarayan et al., 2013; Chang et al., 2015). Numerous adverse consequences, such as extended hospital admissions, a decline in quality of life (QoL), higher expenses for healthcare infrastructure, and excess mortality, are linked to multidrug-resistant (MDR) bacteria (Shallcross et al., 2015; Boucher et al., 2009; Cassini et al., 2019).

The World Health Organization (WHO) recognized the seriousness of this problem and named antibiotic resistance (AMR), emphasizing its importance as one of the top three risks to mankind, as the 2011 World Health Day topic (WHO, 2011).

It is the duty of all healthcare professionals (HCPs), including doctors, nurses, technicians, and pharmacists, to help ensure that antibiotics are used sparingly and maintain their efficacy (CDC, 2019; Nahrgang et al., 2018). Since outpatient settings account for around 90% of AB consumption in human medicine, it is crucial to only deliver these drugs when necessary (Zawahir et al., 2019; Inácio et al., 2017). Community pharmacists (CPs) are essential in primary care since they are frequently the "first and last" points of contact for patients in the healthcare system (The Role of the Pharmacist in the Health Care System, n.d.). Their contributions go beyond distributing prescription drugs, encouraging preventative actions, teaching patients, giving lifestyle guidance, and utilizing pharmacovigilance research to support medication safety (Scarpitta et al., 2019). Furthermore, CPs may be the initial point of contact for patients seeking medical attention due to the increasing burden on primary care infrastructure in many nations, including Hungary (Biro & Elek, 2019). As a result, CPs are essential in helping people take antibiotics responsibly (The Role of the Pharmacist in Public Health, 2014; The Role of the Pharmacist in Encouraging Prudent take of Antibiotics and Averting Antimicrobial Resistance: A Review of Policy and Experience in Europe, n.d.). They are in a prime position to counsel patients on the appropriate use of antibiotics, including topics such as appropriate dosage, application, drug compliance, food and interaction concerns, and possible side effects occurrences, and most significantly, the fundamentals of antimicrobial resistance and the repercussions of abusing AB (Horvat & Kos, 2015).

There are notable differences in the qualitative and quantitative levels of AB consumption among European nations, with a commonly recognized gradient of greater consumption rates from west to east and north to south (Antimicrobial Consumption—Annual Epidemiological Report for 2018, 2019). Hungary has the highest percentage of broad-spectrum antibiotics used among EU member states, despite having a lower-than-average quantitative AB consumption rate (Antimicrobial Consumption—Annual Epidemiological Report for 2018, 2019; Special Eurobarometer 478: Antimicrobial Resistance (in the EU), 2019). A recent Eurobarometer report states that community pharmacies in Hungary provide almost 93% of ABs (Special Eurobarometer 478: Antimicrobial Resistance (in the EU), 2019). But according to another recent survey, around 2% of ABs in the is acquired through non-prescription channels, and within the last ten years, sales of non-prescription AB have increased thrice (Matuz et al., 2007). Additionally, according to a recent Hungarian research, the overprescription of ABs is a result of the rising issue of restricted primary care access (Biro & Elek, 2019).

To the best of our knowledge, no previous study has thoroughly evaluated community pharmacists' perspectives toward their roles in encouraging responsible AB usage. This study attempts to fill this information gap by examining community pharmacists' knowledge, attitudes, and practices regarding the use of antibiotics and infectious illnesses.

Results:

Female (70%) aged between 24 and 35 years (59%). A significant proportion (66%) did not possess any specialized certification beyond their Pharm.D. degree. Among those with specialized certifications, the most common specialization was pharmacy management and operation (38%).

The demographic characteristics of our study population reflect the general profile of community pharmacists in Hungary. The majority of participants were female, which is consistent with the gender distribution of pharmacists in the country. The age distribution suggests that a significant proportion of participants were relatively young, which may indicate a growing interest in the profession among younger generations.

The high proportion of participants without specialized certifications highlights the need for further professional development opportunities. While the majority of specialized pharmacists focused on management and operation, there was a limited representation of other specialties such as pharmacotherapy, pharmaceutical care, and phytotherapy. This suggests a potential gap in specialized expertise in these areas, which may impact the quality of pharmaceutical care provided by community pharmacists.

Table 1:Participants' demographic details

Characteristics	% (n=)
Gender	
Female	70.0% (n = 130)
Male	30.0% (n = 60)
Age	
24–35 years	59.0% (n = 110)
36–50 years	26.0% (n = 50)
over 50 years	12.0% (n = 26)
Specializations Certified by the Board	
No specialties (just a Ph.D.)	66.0% (n = 123)
BCPS (specialization and Pharm.D.)	30.5% (n = 65)
Specializations Represented	
Management and operation of pharmacies	38.0% (n = 65)
Pharmacotherapy and pharmacology	1.0% (n = 3)
Pharmaceutical treatment	1.0% (n = 3)
Using plants as medicine	1.0% (n = 2)

Pharmacist Practices Regarding Antibiotic Resistance and AMS

The majority of pharmacists (68.7%) reported always dispensing antibiotics with complete prescription information. However, a concerning proportion (32.6%) admitted to dispensing antibiotics for longer durations than prescribed. Additionally, 35.4% of pharmacists reported screening antibiotic prescriptions following local guidelines, while 57.6% reported always doing so.

Regarding collaboration and education, 21.5% of pharmacists reported frequently collaborating while 49.3% frequently participated in antimicrobial awareness campaigns. A significant proportion (38.9%) of pharmacists reported frequently educating patients on antibiotic use and resistance.

Alarming, 77.8% of pharmacists reported occasionally or frequently dispensing antibiotics without a prescription. This highlights a significant gap in adherence to prescribing guidelines and a potential risk factor for antibiotic resistance.

The findings of this study indicate a mixed picture of pharmacist practices regarding antibiotic resistance and AMS. While a majority of pharmacists adhere to best practices in terms of dispensing antibiotics with complete prescription information and screening prescriptions, there are areas of concern.

The high prevalence of dispensing antibiotics for longer durations than prescribed is a significant issue, as it can contribute to the development of antibiotic resistance. Similarly, the frequent dispensing of antibiotics without a prescription is a major concern and highlights the need for stricter regulations and improved patient education.

To address these issues, it is essential to implement robust antimicrobial stewardship programs that involve pharmacists. These programs should focus on educating pharmacists about best practices, providing guidelines and tools for appropriate antibiotic prescribing, and promoting collaboration with other healthcare professionals. Additionally, patient education campaigns should be implemented to raise awareness about the dangers of antibiotic misuse and the importance of completing the full course of treatment.

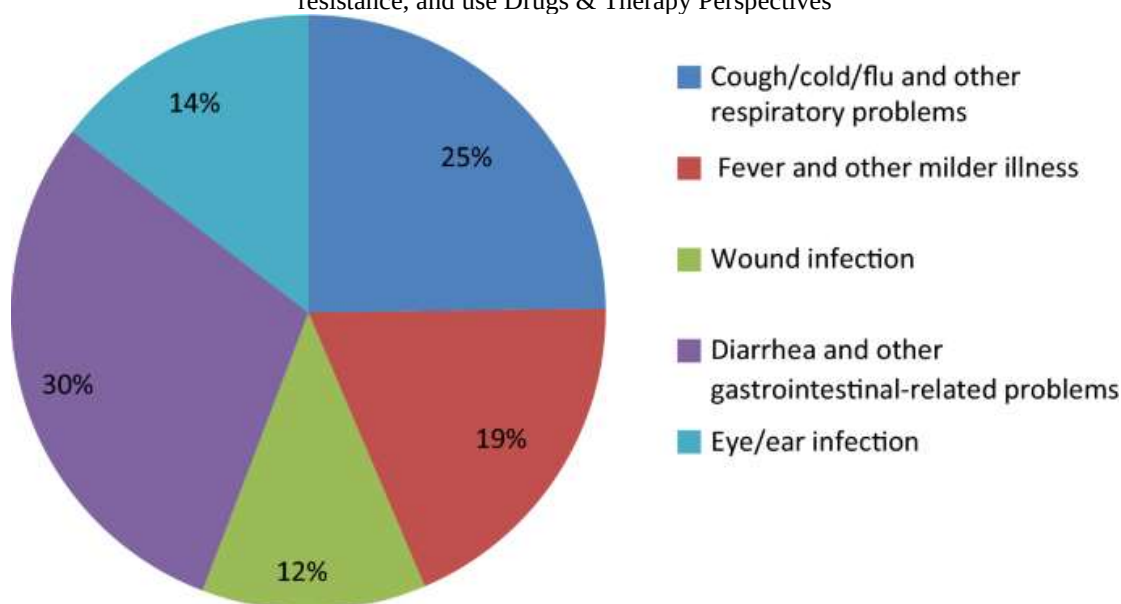
Table 2: Antibiotic resistance and AMS practices of community pharmacists.

Variable	Never (%)	Infrequently (%)	Sometimes (%)	Frequently (%)	Constantly (%)
Dispense antibiotics with complete prescription information	0.0 (0)	1.6 (2)	0.0 (0)	60.0 (98)	26.0 (42)
Dispense antibiotics for longer durations than prescribed	31.5 (46)	30.6 (44)	26.4 (40)	6.4 (12)	0.8 (1)
Screen antibiotic prescriptions following local guidelines	0.0 (0)	2.2 (4)	5.0 (6)	34.4 (50)	54.6 (80)
Work together with other medical specialists on antimicrobial and infection control stewardship	4.9 (7)	30.6 (44)	28.6 (42)	20.5 (30)	12.1 (15)
Participate in antimicrobial awareness campaigns	5.8 (8)	48.2 (70)	26.0 (34)	12.8 (19)	7.8 (10)
Educate patients on antibiotic use and resistance	0.0 (0)	39.0 (55)	21.4 (32)	14.0 (24)	24.0 (32)
Dispense antibiotics without a prescription	0.0 (0)	4.6 (7)	12.8 (19)	78.8 (114)	5.6 (9)

evaluated the antimicrobial stewardship and antibiotic resistance knowledge, attitudes, and practices of Community Pharmacists (CPs) in Zambia. Because of their job experience, most CPs had solid awareness of antibiotic resistance. The application of sound knowledge, however, can be appalling. According to several findings, the majority of pharmacists in Thailand lacked sufficient knowledge. In the fight against antibiotic resistance, having knowledge stops community pharmacists from prescribing medicines irrationally. CPs, on the other hand, dispense antibiotics arbitrarily because to inadequate knowledge, which exacerbates antibiotic resistance. Nasrin et al. (2002) and Deeh et al. (2012).

Most CPs firmly believed that when medications are unable to treat bacterial illnesses, antibiotic resistance develops. This typically happens when. Antibiotics are overused and misused. Since the use of antibiotics has been connected to antibiotic resistance, CPs must assist in the proper administration of antibiotics in order to prevent the growth of bacteria that are resistant to them. All healthcare systems must also create programs and strategies to lower antibiotic use and antimicrobial resistance. (Hayat and others, 2019).

Figure1: Knowledge and attitudes of community pharmacists on the practice of self- antibiotic resistance, and use Drugs & Therapy Perspectives



In our communities, antibiotic resistance is a public health issue that, if left unchecked, increases morbidity and mortality. Most of the CPs in our survey concurred that treating infections might be challenging due to the rise of resistant microorganisms. According to the World Health Organization (WHO), diseases brought on by resistant bacteria are extremely challenging to cure and do transmit from person to person. In addition to lowering the morbidity and mortality linked to antimicrobial resistance, we must fight bacterial infections that are resistant to antibiotics. Klepser et al. (2015), Tegagn et al. (2017), and Drew (2009).

67.4% of community pharmacists had a favorable attitude regarding antibiotic resistance, which was consistent with their age. This optimistic outlook could persuade them to refrain from dispensing antibiotics that aren't prescribed. Antibiotic usage and resistance were seen negatively by most CPs in Syria, which in turn led to CPs giving out antibiotics without a prescription. (Saha and others, 2019).

Community pharmacists must play key roles in infection control and antimicrobial stewardship initiatives, working in tandem with other healthcare professionals. Most participants stated that they participated in infection control and antimicrobial stewardship initiatives in conjunction with other healthcare professionals. Working together, healthcare professionals can prescribe and utilize antibiotics more wisely. (Klepser and others, 2015)

Antibiotic resistance and AMS procedures were subpar, with younger and less experienced CPs exhibiting worse practices than more seasoned and older CPs. Rapid educational intervention efforts among CPs are necessary in light of poor practices regarding antibiotic resistance.

Antibiotic resistance is decreased when doctors and pharmacists work together. In order to assist decrease antibiotic resistance, pharmacists and doctors work together to intervene when certain medicines are administered incorrectly. In order to ensure the best possible usage of antibiotics, CPs should be encouraged to take part in antibiotic awareness programs. In the delivery of community pharmaceutical services, patient education is crucial because it lowers the number of illnesses brought on by bacteria that are resistant to antibiotics. (Tegagn and others, 2017).

Conclusion

The findings indicate that pharmacists possess adequate knowledge of antibiotics and antimicrobial therapy, recognizing the significant public health threat posed by antimicrobial resistance. Their positive theoretical, practical, and preventive attitudes underscore their commitment to patient health and well-being. However, the study also revealed a concerning practice: approximately a quarter of pharmacists dispensed antibiotics without a prescription, despite acknowledging the risks associated with this behavior. Additionally, the influence of patient demand on dispensing practices was evident, highlighting the need for strategies to address patient expectations and misconceptions.

To further optimize the role of community pharmacists in promoting rational antibiotic use, targeted interventions are necessary. These interventions should focus on enhancing knowledge, attitudes, and practices, particularly regarding the appropriate dispensing of antibiotics and patient education. Educational programs, such as workshops and seminars, can help to improve pharmacists' knowledge and skills. Additionally, strategies to empower pharmacists to resist patient pressure and adhere to professional guidelines should be implemented.

By addressing these areas, it is possible to leverage the potential of community pharmacists to play a crucial role in combating antibiotic resistance and promoting the judicious use of antibiotics.

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