

Original Article

Perceptions towards the prescribing of antibiotics by pharmacists and the use of antibiotics in primary care in South AfricaIlse Truter¹, Brent Claud Knoesen¹¹ Drug Utilization Research Unit (DURU), Department of Pharmacy, Nelson Mandela University, Port Elizabeth, South Africa**Abstract**

Introduction: Antibiotics deserve their place a powerful pillar in modern medical care, but the development of antibiotic resistance is emerging faster than the availability of new antibiotics. This poses a major threat to public health. The primary aim was to determine the perceptions towards the prescribing of antibiotics by pharmacists and the use of antibiotics in primary care in Nelson Mandela Bay, South Africa.

Methodology: A questionnaire survey was conducted under community pharmacists during 2014. Purposive sampling was used.

Results: Eighty percent of pharmacists were of the opinion that antibiotics are overprescribed. Amoxicillin, or the combination of amoxicillin with clavulanic acid, was indicated by 87.5% of respondents as the most often dispensed in their pharmacies, with ciprofloxacin, clarithromycin and azithromycin also commonly dispensed. One specific trade name product was mentioned by 43.8% of respondents as the antibiotic product they most often dispense. The most common diagnoses for which antibiotics were dispensed were upper respiratory tract infections and sinusitis. On average, more females (60.0%) were dispensed antibiotics. Most antibiotics were dispensed to adults (44.4%) and children (23.1%). On the question whether respondents were of the opinion that pharmacists should prescribe antibiotics, 50.0% indicated that they do not agree and 31.3% agreed. The main reason was because pharmacists are not qualified to diagnose. However, with further training they should be able to diagnose minor ailments and counsel patients.

Conclusions: Pharmacists had mixed opinions on whether they should be able to prescribe antibiotics. Most pharmacists were of the opinion that antibiotics are overprescribed.

Key words: pharmacists; perceptions; antibiotics; prescribing; usage patterns; South Africa.

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Introduction

The prescribing of antibiotics in primary care increased steadily worldwide during the last decade [1]. Antibiotics deserve their place as a powerful pillar of modern medical care, but the development of antibiotic resistance seems to be emerging faster than the availability of new antibiotics. This observation is widely recognised as a major threat to public health [2].

Self-medication with antibiotics is not permitted in South Africa. Antibiotics in South Africa are only available on prescription [3]. There is a small number of pharmacists in South Africa who have completed the Primary Care Drug Therapy (PCDT) qualification and who have obtained a Section 22A (15) permit issued by the Director General of Health, and who are permitted to diagnose, treat and supply medicines following the Primary Health Care Standard Treatment Guidelines and the list of approved medicines. Only this very small group of pharmacists is allowed to prescribe a limited spectrum of antibiotics [4].

The majority of antibiotic prescriptions for systemic use in Europe and South Africa are prescribed in the outpatient setting [5,6]. Pharmacists are therefore in most cases the last health care professional in the multidisciplinary team who counsel the patient before the patient starts to take the antibiotic. Community pharmacists should take advantage of their accessibility to patients in the community by advising and educating patients, for example, not to request antibiotics from prescribers for self-limiting infections [7].

Irrational and overprescribing and use of antibiotics remain an important contributing factor to the development of antibiotic resistance [8]. Nearly 80% of prescriptions for systemic antibiotics are dispensed in primary care, with respiratory tract infections the most frequent indication [8,9]. Many antibiotics are therefore prescribed for respiratory tract infections even though these infections are known to be predominantly viral [8-11].

Accurate data on antibiotic utilisation must be available to prevent irrational and overprescribing. It is

also important to know what the perceptions are of health care professionals who are responsible for the dispensing of antibiotics in community settings. Not many studies have been conducted measuring the perceptions of pharmacists towards antibiotic prescribing and their usage patterns in primary care settings. A qualitative study of the perceptions of 22 community and primary care pharmacists', and their recommendations for improvement of antibiotic use in Qatar, concluded that education to improve the knowledge of appropriate antibiotic use is needed [12]. The primary aim of the study was to determine the perceptions towards the prescribing of antibiotics by pharmacists and the use of antibiotics in primary care in Nelson Mandela Bay, South Africa.

Methodology

A self-designed questionnaire, based on a review of the literature, was developed to investigate the perceptions of community pharmacists towards the antibiotic prescribing by pharmacists, and the usage patterns of antibiotics as perceived by pharmacists. The questionnaire included questions such as:

- In your opinion, are antibiotics overprescribed?
- Which three antibiotic active ingredients are the most commonly dispensed in your pharmacy?
- What is the most commonly prescribed antibiotic trade name in general?
- What are the three most common diagnoses for which antibiotics are dispensed in your pharmacy?
- Indicate the percentage distribution of antibiotic dispensing in the different gender groups in your pharmacy.

- Indicate the percentage distribution of antibiotics in the different age groups in your pharmacy.
- Do you think pharmacists should be able to prescribe antibiotics?

A pilot study was conducted, from which it was found that the questionnaire will take approximately 10 to 15 minutes to complete. Pharmacists working in community pharmacies in the Nelson Mandela Metropole, South Africa, were included in the study. Purposive sampling was used in order to ensure a diversity of opinion. Data collection took place during 2014. Pharmacists were contacted to determine their willingness to participate in the study, and if consent was given, the questionnaire was either immediately completed or collected from the pharmacist after an agreed period of time. A total of 16 pharmacists participated in the study. Data were captured on an Excel® spreadsheet and analysed. Content analysis was used to identify themes in the responses to open questions. A limitation of the study was the small sample size and the fact that only pharmacists working in one metropolitan area of South Africa were included in the survey.

The study was conducted in accordance with the Declaration of Helsinki [13]. Anonymity and confidentiality were maintained, and no names of pharmacists were recorded on the questionnaires. Ethical approval to conduct the study was obtained from the Research Ethics Committee (Human) of the university (ethics number: H13-HEA-PHAR-002).

Results

Perceptions on whether antibiotics are overprescribed

Respondents were asked if, in their opinion, antibiotics are *overprescribed*. Thirteen of the 16

Table 1. Pharmacists' perceptions regarding whether antibiotics are overprescribed.

Respondent	Comment
1	<i>"Although doctors are more aware, they will still prescribe antibiotics for viral infections often under patient pressure"</i>
3	<i>"Proliferation of super-infections and antibiotic drug resistance"</i>
5	<i>"It's prescribed for almost everything, e.g. the common cold"</i>
6	<i>"Cause most patients with a common cold & flu get a antibiotic offered if there isn't any signs of a secondary infection"</i>
7	<i>"Doc prescribe antibiotics while the patient has flu-like symptoms. (Viral)"</i>
9	<i>"Patients ask for it. Go to other doctor next time if doctor does not want to give antibiotics. Also, they go to doctor too easy for minor ailments. A dr's Rx is easy way out, make sure to cover possibility of infection"</i>
10	<i>"Most infections are viral and then treated with antibiotics"</i>
11	<i>"At least 1 out of every 5 clients has a prescription for an antibiotic"</i>
12	<i>"Patients tend to demand antibiotics from their doctors and hence they believe antibiotics are the answer for everything, including viral infections"</i>
13	<i>"Prescribed for everything. Viral infections etc."</i>
14	<i>"Antibiotics are given too quickly without identifying the core problem of patient"</i>
15	<i>"Dokters skryf dit voor om pasiënte gelukkig te hou al het hulle dit nie nodig nie"</i> (Translation: Doctors prescribe it to keep patients happy even if they do not need it)

respondents (81.3%) were of the opinion that antibiotics are overprescribed. Reasons given for their responses varied (see Table 1), but centered around the theme that patients often put unreasonable pressure on medical doctors to prescribe antibiotics, or that antibiotics are prescribed even if not indicated “to keep patients happy”. Respondents were also of the opinion that antibiotics are sometimes prescribed for viral infections.

Two respondents were of the opinion that antibiotics were *not* overprescribed. Respondent 2 said “... it depends on the prescribing doctor”, and Respondent 4 said that there was a justifiable acute indication for it. Respondent 8 was “not sure” and motivated that, “Parents usually take children to MD [medical doctor] if they are ill thus will get antibiotics”.

Most commonly dispensed antibiotics in community pharmacy

Respondents were asked to list the three antibiotic active ingredients most commonly dispensed in their pharmacies to patients, in decreasing order of frequency (no distinction between gender groups were made). Amoxicillin, or the combination of amoxicillin with clavulanic acid, was indicated by 14 respondents as the most often dispensed in their pharmacies. Two

respondents mentioned penicillin and azithromycin as the most commonly prescribed. Clarithromycin was the antibiotic that was generally mentioned as the second most often dispensed, and ciprofloxacin the antibiotic that was third most often dispensed. Overall, the combination of amoxicillin and clavulanic acid, ciprofloxacin, clarithromycin and amoxicillin were the most often mentioned.

Respondents were asked which antibiotic trade name was generally the most commonly prescribed. One specific trade name product (a combination of amoxicillin and clavulanic acid) was mentioned by nearly a half of respondents (43.8%) as the antibiotic product they most often dispensed, with a further two respondents stated “co-amoxiclav” (and not the registered trade name).

Diagnoses for which antibiotics are the most commonly dispensed

Respondents were asked to list the three most common diagnoses for which antibiotics are dispensed in their pharmacies, in decreasing order of frequency (gender differences were not investigated). The most common diagnoses listed were upper respiratory tract infections (URTIs), urinary tract infections (UTIs) and

Table 2. Responses regarding whether pharmacists should be able to prescribe antibiotics.

RESPONDENT	COMMENT
Motivation for “no” answers	
1	“It will increase the use of antibiotics for viral infections as patients will demand them for flu. I am not convinced that pharmacists will show more control in antibiotic use, and this will lead to higher prescribing”
2	“Nie genoeg kliniese kennis” (Translation: Not enough clinical knowledge)
3	“Not ready yet to diagnose & prescribe such drugs. Lead to over proliferation of already overprescribed drugs & more over-zealous persons in playing field”
7	“We can’t diagnose; but can advise doctors on the use and abuse of antibiotics in retail market”
10	“Most pharmacists don’t have proper facility for examination”
13	“Financial factors will prevail, not necessarily the correct antibiotic for the problem”
14	“We are not qualified to diagnose”
15	“Sodra aptekers dieselfde anatomie en fisiologie leer as dokters kan ons voorskryf. Ons word glad nie geleer hoe om te dink soos dokters nie” (Translated: As soon as pharmacists learn the same anatomy and physiology as doctors we can prescribe. We are not taught to think like doctors at all)
Motivation for “yes” answers	
4	“It would help in expanding coverage, however, I would caution that they would have to show that they are aware of correct/updated epidemiological patterns”
5	“To some extent, e.g. for minor ailments, boils as an example. But it will also have to involve further training and also restrictions should be placed on it”
6	“We don’t have the knowledge for a diagnoses, but we can provide the best choice of antibiotic for a diagnosis”
9	“With proper diagnosis pharmacists should be able to. We have the knowledge ... however, it is difficult to obtain a diagnosis. Pharmacists will also be more responsible”
12	“With proper training, in diagnostics, I believe pharmacists will be able to relieve some of the pressure placed on doctors with acute ailments. This will also ensure timeous treatment of acute infections, as patients tend to go to their pharmacists first for treatment and advice”
Motivation for “not sure” answers	
11	“Pharmacists are knowledgeable about the various antibiotics & indications, however I don’t think they have the proper knowledge and skills to diagnose patients”

sinusitis. Lower respiratory tract infections, bronchitis and pneumonia were also often mentioned.

Other diagnoses mentioned were otitis media, gastrointestinal infections, anaerobic infections and bacterial skin infections. In summary, the majority of respondents (80%) indicated respiratory tract infections as the most common diagnosis, while two respondents mentioned colds and flu, and one respondent sore throat, as the most important diagnosis for which antibiotics were dispensed.

Gender and age groups receiving antibiotics

Respondents were asked to indicate the percentage distribution of antibiotic dispensing to the different gender groups in their respective pharmacies (only an estimated percentage distribution was requested). Respondents indicated that, on average, 57.2% of antibiotics were dispensed to female patients (percentages for females ranged from 30% to 75%).

Four age groups were given (paediatrics, children, adults and the elderly) and respondents were asked to indicate the average percentage distribution of patients receiving antibiotics in the four age groups. Most antibiotics were dispensed to adult patients (44.4%) and children (23.1%).

Perceptions on whether pharmacists should be allowed to prescribe antibiotics

On the question whether respondents think that pharmacists should prescribe antibiotics, 56.3% of pharmacists indicated that they do not agree, 31.3% agreed and 12.4% were not sure..

Responses to the question of whether pharmacists should be able to prescribe antibiotics are indicated in Table 2. In summary, the main reason given why pharmacists should not be able to prescribe antibiotics was because pharmacists are not qualified to diagnose, however, with further training they should be able to diagnose minor ailments and advise patients and prescribers, and therefore can play a role in the responsible and rational prescribing of antibiotics.

Discussion

The study investigated the perceptions towards the prescribing and use of antibiotics in primary care. It was noteworthy that 80.3% of pharmacists indicated that in their opinion, antibiotics are overprescribed. Coenen and colleagues [14] argued that “perceived patient demand” for antibiotics has an effect on the prescribing thereof. Other studies had similar findings and recommended that, apart from prescriber education, there should also be interventional studies to create

better public awareness that antibiotics are not indicated for self-limiting infections. Brink [6] also stated that communication with, and education of, patients is key and that a long-term strategy of multidisciplinary, collaborative, educational programmes and interventions at many levels in society are required. Amoxicillin, or the combination of amoxicillin with clavulanic acid, was the most often dispensed active ingredient in this study. This finding was in agreement with a study that was conducted on a South African pharmacy dispensing database, which also indicated that amoxicillin, or the combination of amoxicillin with clavulanic acid, was the most often dispensed antibiotic [15]. The trade name that was the most commonly dispensed was the same as the product that was the most often dispensed according to previous South African the pharmacy dispensing database studies [15-16].

Antibiotics were the most commonly dispensed for URTIs, UTIs and sinusitis. A qualitative study among households in Kampala revealed the common cold was the most prevalent acute respiratory infection [17]. There was high use of antibiotics in 43% of cases, mainly amoxicillin and cotrimoxazole, before seeking medical care, with a strong correlation between antibiotic use, presence of pneumonia symptoms, level of education of the caregiver and the source of medicines [17]. In the study conducted on pharmacists’ perceptions of antibiotic use in Qatar [12], the most important need identified by pharmacists was an increased knowledge of the general population about appropriate antibiotic use through a variety of educational interventions. Antibiotics were most commonly dispensed to females and children, and just over than (56.3%) of the respondents were of the opinion that should prescribe antibiotics. The findings in general indicated that there is a role for pharmacists to play in antibiotic prescribing, but that this responsibility must be carefully managed, and only after appropriate training of pharmacists to prescribe antibiotics for minor conditions have taken place. The role of the pharmacist in educating the public regarding the responsible use of antibiotics is pivotal.

Conclusion

Approximately half of the respondents were of the opinion that they are not qualified to prescribe antibiotics, but that with further training, they should be in a position to relieve the pressure on medical practitioners in diagnosing and treating minor conditions that require antibiotic treatment. Pharmacists can play a valuable role in educating patients before they seek medical care from a medical practitioner, and

can act as gatekeepers to refer patients with more serious infections. This may assist in containing costs in that the consultation fees paid by patients who seek antibiotics for minor inappropriate conditions (such as the common cold) will be avoided. The challenge will be to break the cycle and to convince patients to first consult their pharmacist for minor conditions. The introduction and use of antibiotic guidelines aimed at pharmacists and protocol-based prescribing in a multidisciplinary group practice with infectious diseases specialists may also increase pharmacists' knowledge and prescribing of antibiotics.

The small sample size is a limitation of this study, and therefore the study can only be regarded as a hypothesis generating preliminary investigation, based on which a larger nationwide study could be conducted. Although the results of this study cannot be generalised, the findings do provide insight into how pharmacists perceive antibiotic prescribing and use in an era where antibiotic resistance is real.

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Authors Contributions

IT conceived and designed the study, collected and analysed the data, and wrote the manuscript.

BCK collected the data, wrote sections of the manuscript, read and approved the manuscript for publication.

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