

Original Research

Dispensing of antibiotics in community pharmacy in Iraq: a qualitative study

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Abstract

Objective: This study aimed to understand the dispensing practice of antibiotics in community pharmacy in Iraq, in addition to explore the community pharmacists' perception about dispensing antibiotics without prescription.

Methods: A qualitative design was conducted on community pharmacists in Baghdad, Iraq. Pharmacists were selected conveniently from different gender, age group, pharmacy type and years of experience. Face-to-face semi-structure interview was used with all the pharmacists to get in-depth understanding about their dispensing practice of antibiotics without prescription in community pharmacy. The data was coded and classified for thematic analysis.

Results: This study found that dispensing of antibiotics without prescription was a common practice in community pharmacy. Pharmacists' perception towards dispensing antibiotics without prescription was associated with the medical condition, safety and efficacy of antibiotics, patients request antibiotics by name, emergency cases, regular customer, promotions from pharmaceutical companies, saving time and cost, brand medications, and poor healthcare services. In addition, there were inadequate knowledge about antibiotic resistance and lack of awareness about antibiotic stewardship leading to inappropriate dispensing practice.

Conclusions: Community pharmacists have poor perception towards dispensing antibiotics without prescription. Educational interventions about antibiotics use focusing on community pharmacists are needed. This will help to optimize the practice of dispensing of antibiotics in the community. In addition, training programs about antibiotic resistance are important to enhance pharmacists' understanding about antibiotic stewardship.

Keywords

Anti-Bacterial Agents; Drug Prescriptions; Inappropriate Prescribing; Professional Practice; Pharmacies; Pharmacists; Commerce; Health Knowledge, Attitudes, Practice; Attitude of Health Personnel; Qualitative Research; Iraq

INTRODUCTION

Dispensing of antibiotics without prescription is one of the factors contributing to irrational use of antibiotics and increasing the rate of antimicrobial resistance (AMR).^{1,2} Antimicrobial resistance has become a concern of public health.² In low and middle income countries, AMR associated with poor practices of healthcare professionals and patients' behavior towards using antimicrobials in addition to the supply and sale of antimicrobials.³ It is estimated that over 50% of the antimicrobials worldwide are obtained without a prescription from community pharmacies.⁴ The non-prescription sale of antibiotics leads to inappropriate choices of antibiotics, and increases the rate of non-adherence to the prescribed course of antibiotics.⁵ Iraqi people tend to use antibiotics for all respiratory infections even those caused by viral infection, such as flu. Although, antibiotics are prescription only medicines, people can easily obtain them without a prescription. Many community pharmacists ignore the general legal guidelines for dispensing antibiotics by making them available without a prescription.^{6,7} In Iraq, antibiotics are dispensing in government sector includes primary

healthcare centers, public hospitals and outpatient clinics. In private sector, antibiotics are only dispensing in community pharmacies because private hospitals do not have own pharmacies. Private hospitals are referring their patients to obtain prescription medicines from community pharmacies. While, there are no community pharmacy chains in Iraq. Community pharmacies are private independent pharmacies which are usually managed by licensed pharmacists to dispense prescribed medicines.^{7,8} Antibiotics are only prescription medicines in Iraq, but dispensing them without a prescription is very common practice in community pharmacies. In other words, the dispensing of antibiotics in community pharmacies is not regulated well. While the prescribing and dispensing of antibiotics in governmental sector is better controlled due to the official rules, the regular reviews of antibiotics' stocks and records by governmental inspectors; in addition to pharmacists' tendency to protect themselves from any legal accountability.⁷ Previous studies reported that dispensing of antibiotics without prescription is frequent in community pharmacy, not only in low-income countries but in the developed countries as well.^{9,10} In Middle East, it has been found that the dispensing of antibiotics without prescription remains a serious problem in many countries such as Syria, Egypt, Jordan, Saudi Arabia, and Iraq.^{6,11-14} Other studies reported that the quality of community pharmacy practice is significantly associated with antibiotics misuse.¹⁵⁻¹⁷ The majority of antibiotics are prescribed and dispensed in community pharmacy; therefore optimizing the use of antibiotics is very important in this setting.¹⁸ However, pharmacists are critically involved to play an active role to improve the appropriate

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use of antibiotics and to reduce the rates of antibiotics resistance, which are reported in many countries.¹⁹ Consequently, a global action plan on antibiotics resistance is prompted to improving the awareness and perception about antibiotics resistance, strengthening the monitoring and researches, reducing the incidence of infections, and optimizing the use of antibiotics.²⁰ Within this context, the appropriate dispensing practices in community pharmacy are essential to ensure the optimal utilization of antibiotics in public.²¹ However, using qualitative approach in pharmacy researches are valuable to explain, understand, and explore perceptions, beliefs, and feelings of pharmacists or patients.²² Besides, there is a lack of information about the dispensing of antibiotics in community pharmacy in Iraq. Pharmacists' perception about the dispensing of antibiotics will give an explanation about the use of antibiotics in community setting. This is very important to implement the needful interventions for supporting antibiotics stewardship in Iraq. This study aimed to explore the dispensing practice of antibiotics in community pharmacies in addition to understand the community pharmacists' perceptions about dispensing of antibiotics without prescription.

METHODS

Study design

An exploratory study was carried out using qualitative method to get in-depth-understanding about the dispensing of antibiotics in community pharmacies in Baghdad, Iraq. Qualitative data can assist to expose pharmacists' perceptions and explore the aspects related to irrational dispensing practice of antibiotics and its possible solutions and reasons. Besides, qualitative data may provide explanations and answers the questions raised in quantitative studies.

Study sample

A convenience sampling method was used to select the community pharmacists from different types of community pharmacy, age group, gender, level of qualification, and years of experience. This study was conducted on February 2020 among community pharmacists in Baghdad, Iraq. All community pharmacists in Baghdad city are eligible to participate in this study. Data triangulation approach was used to promote data collection through different sampling technique such as different contexts for the same or varying participants.²² To ensure the diversity of sample, community pharmacies were selected purposively based on their locations from residential areas and medical complex. Independent Pharmacy (IP) was located in residential areas while Medical Complex Pharmacy (MCP) was located inside medical complex or beside medical complex. Accordingly, community pharmacists in these community pharmacies were invited to participate in this study. The sample was included 20 community pharmacists. The data saturation was achieved based on the process of data collection; this was related to which the new data repeat what was presented in previous data.²³ In this study, the research team concluded that no more new ideas are expected to obtain from additional sample.

Interview guide development

An interview guide was developed based on previous studies related to dispensing of antibiotics in community pharmacies.^{14,15} The interview guide was focused on the dispensing of antibiotics without prescription, perception towards dispensing of antibiotics without prescription, and knowledge about antibiotics resistance. Interview guide was discussed with two experts in the field of pharmacy practice from the Universiti Sains Malaysia and the University of Baghdad. In addition, the credibility and the accuracy were applied to ensure the contents of study topic are maintained. The interview questions were pre-tested by three independent pharmacists to enhance the applicability and to ensure the clarity of the questions in the concept of study. The credibility of data was achieved by the process of member checking which included returning the data, categories, interpretations and conclusions to the participants.²² The reliability of the findings was assessed by checking the final transcripts with the pharmacists to maintain the trustworthiness of data.

Face-to-face interview

Pharmacists were face-to-face interviewed to get in-depth understanding about the dispensing of antibiotics in their community pharmacies. Semi-structure interview was carried out to explore more ideas and views about the concept of study. Prior to the appointment of the interview, all the participants were clearly informed about the aim of study and they were also informed that the data will be kept confidential for the research purpose only. Written informed consent was obtained from the participants before starting the interview. Ethical approval was obtained from the Syndicate of Iraqi Pharmacists before conducting this study. Pharmacists were interviewed in community pharmacy or any other place convenient to them according to their request. In addition, relevant information regarding pharmacists' demographic data was collected accordingly. The interviews were carried out in Arabic language to facilitate more discussion and understanding about dispensing practice of antibiotics. Each interview took approximately 45-60 minutes. All the interviews were audio-recorded and then transcribed verbatim.

Characteristics	N	
Age	25-34	8
	35-44	10
	45-54	2
Gender	Male	9
	Female	11
Education level	BSc Pharm	18
	Higher degree (MSc, PhD)	2
Year of experience	3-5	4
	6-9	4
	10 years and above	12
Pharmacy type	Medical complex pharmacy	8
	Independent pharmacy	12

Data analysis

All audio-recorded interviews were transcribed verbatim and translated into English by the principal researcher. Transcripts were then checked by a linguistic translator to minimize the grammatical errors. Inductive thematic analysis was conducted based on the process of assembling similar ideas, defining and generating themes, and combining themes to produce final themes.²⁴ Data analysis was processed by identifying the initial codes. Both researchers were then met to agree on the matching themes. The generated themes were then combined and organized by a third researcher to produce the final themes. The final themes and conclusions were discussed with the research team to confirm the aim of study and to ensure data credibility.

RESULTS

The majority of the participants (18) have a bachelor degree in pharmacy and only two of them completed higher degree. Most of them have experience of more than 10 years in community pharmacy. Table 1 shows the community pharmacists' characteristics.

The dispensing practice of antibiotics was explored based on semi-structured interviews with twenty community pharmacists. With regard to dispensing practice of antibiotics, pharmacists in both types of pharmacy were commonly dispensed antibiotics without prescription. The estimated numbers of antibiotics dispensed without prescription was various from 10 cases to 50 cases per day as shown in Table 2. However, all the pharmacists explained that they dispense antibiotics without prescription for different medical conditions including Respiratory Tract Infections (RTIs), tonsillitis, otitis media, Urinary Tract Infections (UTIs), diarrhea, skin infection, toothache, sore throat, common cold and flu. The most commonly dispensed antibiotics without prescription were amoxicillin, ciprofloxacin, cephalexin, cefixime, erythromycin, azithromycin, doxycyclin, trimethoprim, and amoxicillin/ clavulanic acid.

From thematic analysis, five themes were identified to influence the dispensing practice of antibiotics without prescription in community pharmacy. The main themes were: (1) perception towards factors motivating dispensing of antibiotics without prescription, (2) perception towards factors preventing dispensing of antibiotics, (3) awareness about antibiotic stewardship; (4) knowledge about antibiotic resistance; and (5) reasons of antibiotic resistance.

Theme 1: Perception towards factors motivating dispensing of antibiotics without prescription

Pharmacists have the tendency to dispense antibiotics without prescription to their patients in both types of pharmacies. They expressed the main factors associated with dispensing of antibiotics without prescription which included the medical condition, safety and efficacy of antibiotics, patients request antibiotics by name, emergency cases, regular customer, promotions from pharmaceutical companies, save time and cost, brand medications, and poor healthcare services.

Medical condition:

Community pharmacist	Type of pharmacy	antibiotics dispensed without prescription
P1	IP	15
P2	MCP	5
P3	IP	50
P4	IP	20
P5	IP	10
P6	MCP	5
P7	IP	8
P8	IP	5
P9	IP	10
P10	IP	10
P11	MCP	4
P12	IP	40
P13	MCP	10
P14	IP	10
P15	MCP	5
P16	MCP	3
P17	MCP	10
P18	IP	15
P19	MCP	10
P20	IP	7

* Estimated number of antibiotics dispensed without prescription per day
IP, Independent Pharmacy; MCP, Medical Complex Pharmacy

The majority of the pharmacists believed that their role is diagnosing the medical problem of the patient and dispensing the suitable antibiotic without prescription to treat medical conditions in case of bacterial infections such as tonsillitis, urinary tract infections, skin infection, and other bacterial infections.

"Yes, sometimes I dispense antibiotics without prescription for bacterial infections such as UTIs, tonsillitis, skin infection that should be treated by using antibiotics. But, I generally dispense antibiotics as prescribed by the doctor." [P15, MCP]

"Yes, I dispense antibiotics without prescription. I think that some cases should be treated by antibiotics. I think pharmacist is able to manage some infections and give the suitable choice of antibiotic for bacterial infection." [P18, IP]

Safety and efficacy of antibiotics:

All the pharmacists felt safe to dispense antibiotics without prescription because they considered antibiotics an effective for bacterial infections. However, three pharmacists dispense antibiotics without prescription because they believed that antibiotics are safe to use with lesser side effects and cheaper price.

"I dispense antibiotics without prescription, I think antibiotics are safe to use with lesser side effects and cheap price." [Pharmacist 3, IP]

"It is safe to dispense antibiotics without prescription, especially if the patient has used it before to treat an infection. Antibiotic is effective for bacterial infection." [Pharmacist 10, IP]

Patients request antibiotics by name:

Most of the pharmacists reported that they dispense antibiotics without prescription because some antibiotics are common in their community that the patients request them by name. Other pharmacists reported that they dispense antibiotics without prescription when the patients request them by name because most patients have used these antibiotics in recurrent infection.

"I dispense antibiotic when the patient requests it by name because he had used it before for the same medical condition and he knew how to use it. I also dispense antibiotic if I satisfied that the type of antibiotic is useful for his illness." [Pharmacist 2, MCP]

"I dispense antibiotics when the patient requests it by name especially popular antibiotics such as amoxicillin or Augmentin, that the patient knows the instructions of use. I explain the use of antibiotic for the patient before dispensing it; if he knows how to use it, I dispense it accordingly" [Pharmacist 5, IP]

Emergency case:

All of the pharmacists in community pharmacy reported that they dispense antibiotics without prescription to manage some emergency cases such as diarrhea or tonsillitis; and especially when the doctor's clinic is not available.

"I dispense antibiotic in some cases when the doctor is not available with explaining the instructions of use for example, in diarrhea cases and acute tonsillitis." [Pharmacist 3, IP]

Regular customer:

The majority of community pharmacists exposed that they dispense antibiotics without prescription to their regular customers to avoid losing them. Only five pharmacists stated that they dispense antibiotics for medical condition that is actually required antibiotics.

"I consider some patients as regular customers that I dispense antibiotics to them to avoid losing my customers. I take into account that the medical condition is required antibiotic, and I will explain the information about dose." [Pharmacist 7, IP]

"I think it is not related to regular customers, it is related to the medical condition. I will not dispense antibiotics if the case does not require antibiotic such as in viral infection and I will advise my customer for that." [Pharmacist 11, MCP]

Promotions from pharmaceutical companies:

Most of the pharmacists explained that dispensing of antibiotics without prescription is not affected by the promotions from pharmaceutical companies. Only three pharmacists felt that promotions from pharmaceutical companies are encouraging them to sell more antibiotics.

"I don't dispense antibiotic to get promotions from pharmaceutical companies or to achieve

financial benefit, but it is enough for me to comply with the doctor's prescription or depend on the medical condition that is actually requiring antibiotics." [Pharmacist 8, IP]

"Sometimes, promotions from pharmaceutical companies may encourage increasing the sale of antibiotics but it is still within the benefit of antibiotic for the patient's condition." [Pharmacist 9, IP]

Saving time and cost:

Pharmacists in both types of pharmacy explained that they tend to dispense antibiotics without prescription because patients want to save time and cost of doctor's consultation by obtaining antibiotics from community pharmacy.

"I dispense antibiotics without prescription because the patients prefer to buy antibiotics from community pharmacy to save time and cost of doctor's consultation." [Pharmacist 2, MCP]

Brand medications:

Pharmacists reported that the availability of brand antibiotics in community pharmacy influenced them to dispense antibiotics without prescription. Patient's preferences to obtain brand antibiotics from community pharmacy making them accessible without prescriptions.

"Patient prefers going to community pharmacy to obtain brand and original antibiotics rather than going to public healthcare facilities which they usually dispense the generic ones." [Pharmacist 10, IP]

Poor public healthcare services:

The majority of pharmacists stated that the poor services in public healthcare facilities influencing them to dispense antibiotics without prescription. The lack of medicines and the poor quality of medical care in public hospital encourage patients to consider the community pharmacist as the first health care provider for seeking medical assistance and health advice.

"It's depending on the current situation in Iraq that most patients go to buy antibiotics from community pharmacy because of the lack of medicines in public healthcare facilities and the poor services in primary healthcare centers and general hospitals. In addition, patients trust in pharmacist to manage their health problems." [Pharmacist 18, IP]

Theme 2: Perception towards factors preventing dispensing of antibiotics

The majority of pharmacists reported that they tend to stop dispensing of antibiotics in case of inappropriate choice of antibiotic, patient with complicated and critical condition, and patient allergic to antibiotic.

Inappropriate choice of antibiotic:

Most of the pharmacists explained that they do not dispense antibiotics if they feel that the choice of antibiotics is inappropriate. But, some pharmacists

preferred to refer patients to respective doctor to confirm the choice of antibiotic.

"I stop dispensing of antibiotic if I believe that the choice is incorrect such as in UTI infections and the requested antibiotic is not working on such types of infections, or the antibiotic is incompatible with patient's condition." [Pharmacist 12, IP]

"I dispense antibiotic in case of the doctor prescribed it, but if I am not sure about the choice of antibiotic, I will refer the patient to doctor to confirm the choice of antibiotic." [Pharmacist 13, MCP]

Complicated and critical conditions:

All of the pharmacists in both types of pharmacy revealed that they do not dispense antibiotics to patient with complicated symptoms or critical conditions which are required doctor's consultation.

"I cannot dispense antibiotic if the patient has complicated conditions which are required doctor's consultation or lab test such as patient complaining of abdominal pain." [Pharmacist 14, IP]

Patient allergic to antibiotic:

All of the pharmacists reported that they stop dispensing of antibiotics in case of patient allergic to certain antibiotics.

"I don't dispense antibiotic if the patient is allergic to antibiotic such as amoxicillin allergy." [Pharmacist 18, IP]

Theme 3: Awareness about antibiotic stewardship

Most of the pharmacists were unaware about antibiotic stewardship or antibiotics guidelines to optimize the use of antibiotics. In addition, they did not register in any training program related to antibiotics use or antibiotics resistance. Few pharmacists referred to an antibiotic program aimed to minimize the use of antibiotics.

"I don't have any information about antibiotic stewardship and I have never been registered in any program relating to antibiotics use or antibiotic resistance." [Pharmacist 18, IP]

"I heard about an antibiotic program aimed to reduce the use of antibiotics and to treat the symptoms through using antihistamine and analgesics and making the body depend on its immunity. But, I have never been registered in any program relating to antibiotic stewardship, I read about antibiotics in the internet." [Pharmacist 1, IP]

Theme 4: Knowledge about antibiotic resistance

The majority of pharmacists have at least the basic knowledge about antibiotic resistance that is related to bacteria development. But they were unable to explain how these bacteria have developed. Generally, pharmacists knew that some antibiotics became ineffective to kill some types of bacteria; and they expressed some reasons for the problems of antibiotic resistance.

"The bacteria become resistant to some antibiotics due to the development of those bacteria that using antibiotics are not effective to kill them." [Pharmacist 19, MCP]

"Antibiotic resistance is that the bacteria developed to resist the effect of antibiotic." [Pharmacist 20, IP]

Theme 5: Reasons of antibiotic resistance

Most of the pharmacists explained that antibiotic resistance was occurred due to the misuse of antibiotics in terms of the overuse and underuse of antibiotics. While some pharmacists explained other reasons which are included the cost of antibiotic course, patient's belief about antibiotics, self-medication with antibiotics, poor restrictions and easy accessibility, doctors' tendency to prescribe antibiotics, and poor pharmacy practice.

"I think that the reasons of antibiotic resistance are the misuse of antibiotics, patient's beliefs about antibiotics to use antibiotic for illnesses that are not required antibiotics." [Pharmacist 6, MCP]

"The reasons of antibiotic resistance are the poor restrictions about antibiotics and easy access to antibiotics in the country." [Pharmacist 7, IP]

"I think that antibiotic resistance is occurred because of the doctors, they prescribe antibiotics too much especially for illness doesn't require antibiotic." [Pharmacist 8, IP]

"The main reason of antibiotic resistance is the poor pharmacy practice." [Pharmacist 9, IP]

DISCUSSION

This study found that dispensing of antibiotics without prescription was a common in both types of community pharmacy in Baghdad. Community pharmacists tend to dispense antibiotics when requested they by name. This finding is similar to previous studies conducted in middle-east countries indicated that pharmacists seem to be irresponsible to dispense antibiotics without prescription by ignoring the rules and regulations in many cases.^{14,25,26} However, a study in Saudi Arabia showed that the law enforcement was associated with reducing the dispensing practice of antibiotics without prescription.²⁷

This study also showed that pharmacists have the tendency to manage some medical conditions by prescribing and dispensing antibiotics without prescription. Most of them prescribe antibiotics without doctor's prescription for some infections such as urinary tract infections (UTIs), tonsillitis, and skin infections. However, dispensing of antibiotics without prescription is releasing a wrong message to patients and encouraging them to continue obtaining antibiotics without doctor's consultation. Previous studies showed that community pharmacists dispensed antibiotics without prescription for certain medical conditions.²⁷⁻²⁹ Obtaining antibiotics without medical prescription could raise the risk of antibiotics resistance.^{29,30} In many cases, pharmacists have difficulties to differentiate between bacterial and viral infections to dispense the right

antibiotics for the right patient; and increasing the possibility of negative outcomes.¹⁴ This might be happened due to the poor restrictions of dispensing practice in Iraq is not effectively applied to control the decision of community pharmacists in dispensing antibiotics without doctor's consultation. On the other hand, some pharmacists in this study believed that antibacterial agent has lesser side effects compare to other antimicrobial agents that they felt it is safe to dispense antibiotics without prescription. A study by Al-Mohamadi et al. (2013) indicated that some pharmacists considered antibiotics are safe to patients, and this represents the risk implied to society, requiring an urgent reconsideration from the health authorities.³¹ This misconception requires efforts to improve the education of pharmacists about the possible side effects of antimicrobials and its appropriate dispensing.³²

With regard to the factors encouraging pharmacists to dispense antibiotics without prescription, this study found that most of the pharmacists dispense antibiotics without prescription when the patient requests them by name. Similar findings have been found in previous studies showed that the community pharmacists dispense antibiotics when patients requested them by name due to the familiarity with such antibiotics or because patients had been used them previously.¹⁴ Another study stated that patients can easily obtain antibiotics from community pharmacy either by requesting them by name or by simply presenting their medical condition to the pharmacist.²⁶ While other studies reported that requesting antibiotics by name and the financial benefits were the main reasons for dispensing of antibiotics without prescriptions.^{14,26,33} This study revealed that all the pharmacists have the tendency to dispense antibiotics without prescription for emergency conditions such as diarrhea and upper respiratory infections especially when the doctor's clinic is not available. In concordant with a study in Saudi Arabia reported that the emergency cases and the unavailability of clinic after working hours were the reasons given by pharmacists to dispense antibiotics without prescription.¹⁴ However, a study in Lebanon reported that almost 41% of the antibiotics prescribed by pharmacists were unnecessary because the medical condition is most likely of a viral infection especially in respiratory conditions and diarrhea.²⁶ Another study in Saudi Arabia indicated that pharmacists prescribed unnecessary antibiotics for diarrhea, respiratory infections and urinary tract infections.¹⁵ This might explain the tendency of pharmacists to manage some infections depending on their skills and experiences by giving reasonable cases for this practice. This study was also showed that most of the pharmacists tend to dispense antibiotics without prescription to their regular customers and few of them dispensing of antibiotics to regular customers to avoid losing them or because antibiotics can be obtained from other community pharmacies. Similarly, previous studies also showed that the community pharmacists dispensed antibiotics without prescription to avoid losing their customer. Pharmacists stated that refusing to dispense antibiotics without prescription will negatively influence their sales and earnings; especially when the customer would be able to obtain antibiotics from other community pharmacies.^{16,27,31} Lack of drug regulations is the main reason for increasing sale of

antibiotics without prescription for pharmacist who need to ensure business-continued existence.¹⁷

In this study, pharmacists stated that patients prefer to buy antibiotics from community pharmacy to save time and cost of doctor's consultation. Various studies have reported similar findings indicating that saving time and cost was associated with dispensing of antibiotics without prescription.^{10,14,15} In fact, patients may spend long time for consulting a doctor and keep waiting in a long queue in the primary healthcare centers or even in the private clinics.³⁴ However, the cost of doctor's consultation is apparently expensive leading the patients to self-purchasing of antibiotics from community pharmacy.^{34,35} In addition, there is a lack of awareness that unnecessary use of antibiotics is ineffective and costly; and it can contribute to antimicrobial resistance.³⁶ Pharmacists in this study reported that the availability of brand antibiotics in community pharmacy encouraged them to dispense antibiotics without prescription. Previous studies showed that dispensing of brand antibiotics without prescription was common due to the impact of pharmaceutical companies to promote their brand in any possible way.³⁴ Another study in Jordan showed that 67% of the dispensed antibiotics were brands antibiotics. Costumers' tendency to obtain brand medicines was led to self-purchasing of antibiotics.³⁷ Community pharmacists might be negatively perceived that brand antibiotics are safe and more effective than generic ones; without taking into account the burden of cost for unnecessary antibiotics.

On the other hand, this study is also revealed that the poor healthcare services and the lack of medications in public healthcare facilities influenced the community pharmacists to dispense antibiotics without prescription. Similar finding was reported by Saleem *et al.* (2016) that the lack of healthcare services and poverty of people to afford the cost of doctor's consultation increased the self-purchasing of antimicrobials.³⁸ The lack of access to good-quality in primary healthcare increased the problem of antibiotic resistance especially in low- and middle-income countries where the healthcare services are under-estimated. These countries are particularly at risk of high rate of resistance because the second-line antibiotics required to fight the most resistant infections are often unaffordable.^{38,39}

With regard to factors preventing pharmacists from dispensing of antibiotics, this study showed that pharmacists stated to stop dispensing of antibiotics when they feel that the choice of antibiotics is inappropriate and some of pharmacists tended to refer patients to respective doctor to confirm the choice of antibiotic. A study in Saudi Arabia reported that the pharmacists were concerned about physicians' prescribing decisions to write unnecessary antibiotics without any medical justification.³⁴ Incorrect choice of antibacterial is considered as a significant aspect involved in irrational use of antibacterial.⁴⁰ However, a study in Jordan showed that the choice of dispensed antibiotics by community pharmacists was inappropriate.³⁷

On the other hand, this study showed that pharmacists refused to dispense antibiotics without prescription to patient with complicated symptoms or critical conditions which are required a doctor's consultation. Similar findings



have found in literature that pharmacists would not dispense antibiotic in complicated medical cases and for patients with lack of medical history; this probably because pharmacists want to protect themselves from any negative outcomes that make them legally accountable.¹⁴ In this study, pharmacists stated to stop dispensing of antibiotics in case of patient allergic to certain antibiotics. In consistent with a study by Bahnassi, (2015) reported that pharmacists asked patients about antibiotic allergy, presence of chronic diseases, or using other medications before dispensing the antibiotics.¹⁶ Another study also reported that most of the pharmacists asked patients about antibiotics allergy.⁵ Pharmacist is responsible for patient safety when ensuring that the patients are not allergic to prescribed medications, or there are no interactions with another medication using by patients or food interactions.⁴¹ This might explain that pharmacists have the awareness about patient's safety in case of drug allergy; in addition to pharmacists' skills and experiences to avoid any negative outcome.

With regard to the awareness about antibiotic stewardship, this study indicated that community pharmacists were unaware about antibiotic stewardship programs. Findings from previous studies found that there is a lack of awareness about antibiotic stewardship among pharmacists, and lack of training to carry out antibiotic stewardship.^{40,42,43} However, antibiotic stewardship should importantly focus on pharmacy education since postgraduate training is not implemented for pharmacists. Pharmacists may not have been provided by essential and adequate amounts of education to improve antibiotic stewardship.⁴⁴

This study showed that pharmacists have the basis knowledge about antibiotic resistance that antibiotics are ineffective to kill the bacteria. Pharmacists also stated that antibiotic resistance occurred due to the irrational use of antibiotics in terms of overuse and underuse of antibiotics. Other pharmacists explained other reasons such as the cost of antibiotic course, patient's belief about using antibiotics, self-medication, poor restrictions and easy accessibility, doctors' tendency to prescribe antibiotics, and poor pharmacy practice. A previous study in Pakistan reported that the pharmacists had good knowledge about rational use of antibiotics, but they did not apply the current strategies of antibiotic stewardship to optimize the use of antimicrobials.⁴⁰ A study found that dispensing of antibiotics without prescription was high compared to prescribed antibiotics, and community pharmacists have lack of knowledge about antibiotic resistance.⁴⁵ This study is limited to face to face interviews, so the findings may explain the perception towards the dispensing practice of antibiotics but it does not show the appropriateness of

practice when antibiotics dispensed without prescription. In addition, factors influencing perception of community pharmacists were not assessed in this study. It is suggested that a survey study can help to show factors associated with pharmacists' perception towards the dispensing of antibiotics. In addition, pharmacists may influence by the moderator when explaining his opinions and perceptions toward dispensing of antibiotics, so this may contribute to bias findings into the study.

CONCLUSIONS

This study showed that dispensing of antibiotics without prescription was a common practice in community pharmacy. Pharmacists' perception towards dispensing of antibiotics without prescription was associated with many factors encouraging pharmacists to ignore the rules and regulations; in addition to the poor restrictions for this practice at the community-pharmacy level. Pharmacists were well aware about the negative impact of antibiotics misuse on public health especially in term of antibiotic resistance, but their inappropriate dispensing practices were apparently poor in many cases. In addition, there was a lack of awareness about antibiotic stewardship leading to inappropriate dispensing practice. The regulations for dispensing prescription medicines should be enforced at the community pharmacy to control the dispensing practice of antibiotics without prescription. Educational interventions are needed to improve pharmacists' knowledge about antibiotic resistance; in addition to adequate training for pharmacists and physicians about the rational use of antibiotics to improve their understanding about antimicrobial stewardship. This will help to optimize the use of antibiotics in community setting. Moreover, information about antibiotics use and antibiotic resistance should be incorporated in the curriculum of pharmacy colleges to ensure good pharmacy practice in the future.

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CONFLICT OF INTEREST

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