An-Najah National University

Faculty of Graduate Studies

Pharmacists Sale of Antibiotics Without Prescription: A Cross Sectional Study in West Bank, Palestine

By

Hiba Howari

Supervisor

Dr. Mariam AL-Tell

This Thesis is Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Public Health Management, Faculty of Graduate studies An-Najah National University, Nablus - Palestine.

2021

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This Thesis was Defended Successfully on 29/12/2021 and approved by:

Defense Committee Members:	**Signature**
• **Dr. Mariam Al tall / Supervisor**	.....
• **Dr. Hussien Hallaq / External Examiner**	.....
• **Dr. Rowa Ramahi / Internal Examiner**	.....

Dedication

إلى من تمنيت وجوده ليشاركني نجاحي...إلى المضحي المحب الاب...من تعلمت منه الثبات والقوة...الأغلى دائما والدي رحمه الله واسكنه فسيح جناته.

إلى من وجودها حياة ودعواتها نجاة والجنة تحت قدميها...أمي الحنونة.

زوجي حبيبي ورفيق دربي.

أولادي الأحباء...خالد وعلي وسام.

أخوتي الغاليين...معاذ ونور وشهد.

عائلة زوجي الأعزاء.

طلاب العلم في كل مكان.

الأسرى البواسل في سجون الاحتلال.

الشهداء الكرام الذين رووا بدمائهم ارض فلسطين.

إليكم جميعا اهدي هذا البحث وأسأل الله أن ينفع به لما فيه خير لهذه البلد.

Acknowledgment

الحمدلله على فضله أولاً وأخيراً...الحمدلله الذي مَنَّ عليّ ووفقني لإتمام هذه الرسالة.

الشكر إلى الدكتورة مريم الطل لإشرافها على هذه الرسالة بنصحي وتوجيهي وحثي على البحث والتعلم.

الشكر لزوجي الدكتور إسماعيل قطاوي...السند لي في كل خطوة.

الشكر لاولادي فمنهم تعلمت الصبر وتنظيم الوقت...انتم مصدر النور الذي اضاء لي وشجعني لأكمل هذه الطريق.

الشكر لأُمي...اخي...اخواتي انتم مصدر القوة والأمان.

الشكر لأعضاء لجنة الممتحنين: الدكتورة رواء الرمحي والدكتور حسين الحلاق على متابعتهم وتوجيهاتهم.

واتوجه بجزيل الشكر لكل من ساهم في إنجاح هذا البحث وكل من تمنى لي التوفيق.

الاقرار

أنا الموقع أدناه، مقدّم الرسالة التي تحمل العنوان:

Pharmacists Sale of Antibiotics Without Prescription: A Cross Sectional Study in West Bank, Palestine

أقر بأن ما اشتملت عليه هذه الأطروحة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الاشارة إليه حيثما ورد. وأن هذه الرسالة كاملة، أو اي جزء منها لم يقدم من قبل لنيل اي درجة او لقب علمي او بحثي لدى أي مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name: صبحي علي ابراهيم حواريح **اسم الطالب:**

Signature: **التوقيع:**

Date: 29.12.2021 **التاريخ:**

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Pharmacists Sale of Antibiotics Without Prescription: A Cross Sectional Study in West Bank, Palestine

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Dr. Mariam AL-Tell

Abstract

The irrational use of antibiotics especially dispensing antibiotics without a medical prescription exacerbates the antibiotic resistance problem. The community pharmacies are the main source for this practice. There is an urgent need to change the way we use antibiotics, specially in the absence of a well enforced law and strict regulations. A cross sectional descriptive study aimed to assess pharmacists' contributions in the antibiotic resistance problem and their adherence to law and regulations regarding not dispensing antibiotics without prescription. Data was conducted between April and June 2021. A validated and pilot-tested questionnaire, was completed by the community pharmacists themselves.

Community pharmacists were chosen using a convenience sample method, distributed over the 10 districts of West Bank (n=277). The number of pharmacies in each district was determined by using a proportional stratified sample method. Data was entered and analyzed using SPSS version 19. The extent of dispensing antibiotics without prescription among community pharmacists was found to be 94.2%. Patient inability to visit a doctor (58.1%) was the most common cause for dispensing antibiotics

without prescription. The most frequently dispensed antibiotic was Amoxycillin (63.2%), and the most symptom for which pharmacists dispensed antibiotic without prescription was sore throat with fever with 72.6% and 80.1% for children and adults respectively. 90.6% of participated pharmacists know about the policy of not dispensing antibiotics without prescription. Furthermore, no statistically significant association was found between dispensing antibiotics without prescription and all the independent variables. This study revealed that antibiotic sales without medical prescription in community pharmacists in the Palestinian West Bank are highly practiced. More regulations, multiple strategies, and follow up are needed by policymakers to avoid the inappropriate use of antibiotic.

Chapter One
Introduction

Antibiotics have saved and treated millions of people. However, the inappropriate use affects the effectiveness in fighting off infections, and bacterial infections again threaten people's lives. This misuse and overuse led to the antibiotic resistance problem. Now, the crisis of antibiotic resistance has become a global challenge. (Ventola, 2015).

Over the years, the use of antibiotics has been increased and this overuse is not restricted only to medical prescriptions. Dispensing antibiotics without a medical prescription is a common practice around the world including Arab countries. People can obtain antibiotics from hospitals, community pharmacies, or even through relatives and friends.Where community pharmacies are the most important source from which people can directly purchase antibiotics without a prescription. This practice is illegal in most countries around the world including Palestine.

In Palestine, the legislations prevent pharmacists from dispensing antibiotics without a prescription. However, no right commitment from pharmacists is found. (Bitar*et al*., 2017).Many determinants and challenges in Palestine prevent the rational use of antibiotics and lead to antibiotic misuse and give the people a chance to easily obtain antibiotics without a prescription, likely due to; inadequate training and lack of knowledge of the medical team. Most of our practitioners prescribe antibiotics without having a culture test, and they mainly depend on the medical

representatives to get information about the used antibiotic. (Ambwani, &Mathur, 2006). We should note that doctors who work in mobile areas are facing a lot of difficulties in reaching an accurate diagnosis due to the lack of diagnosis facilities. (Ambwani, &Mathur, 2006).Pharmacists themselves are considered one of the major challenges to achieving the rational use of antibiotics; the sale of antibiotics is an important part of pharmacist's income. (Ambwani, &Mathur, 2006).

The patient believes that "every ill has a pill" and the patient's expectations from the doctor to hide the symptoms lead the doctors to prescribe an antibiotic for most sicknesses like in the case of the common cold. (Ambwani, &Mathur, 2006; Cals *et al*.,2007).Upper and lower respiratory tract infections like the common cold, acute bronchitis, and even some pneumonia cases; are mostly viral in origin and do not need an antibiotic to be treated. (Cals *et al*.,2007).Taking antibiotics when you have a viral infection may harm and taking an antibiotic when there is no needincreases the risk of getting an infection later and increases the risk to resist that antibiotic. (Llor, &Bjerrum, 2014).

Also, there is poor communication between the medical practitioners and the patient, for example; the doctor does not give the patient enough time to clarify the symptoms, and they do not explain the information about his illness and drugs. (Rangan, Kumari, &Chakrawarty, 2015).Both pharmacists and doctors are responsible for the irrational use of the antibiotic.(Machowska, &Lundborg, 2019).The patients in most cases stop

taking the antibiotic when the symptoms disappear and feel better and this is an important cause of the antibiotic resistance problem.

In addition, Palestinians generally believe in traditional healing and herbal remedy instead of treating with drugs and antibiotics, which has become an important part of Palestinian people's culture. (Khdour*et al*., 2016).Traditional and Islamic herbal medicines are considered as usual practices in our region to maintain good health and relieve symptoms of many illnesses. (Khdour *et al*., 2016). For example; treating bacterial bronchitis by drinking thyme and ginger or rubbing olive oil onto the chest and throat. This may relieve the symptoms but the case will get worse and life threatens complications like septicemia may happen and lead the patient to take IV antibiotics to get better.

Another determinant is related to the laboratory services, while making microbiological cultures to know the type of bacteria, errors may happen, and this leads to giving thewrong antibiotic. (Ambwani, &Mathur, 2006).

The global drug explosion and the increase in the number of manufactured drugs have complicated the doctor's choice of proper antibiotic for the particular indication, the increase in the number of medical representatives for pharmaceutical advertising, and promotional activities of pharmaceutical industries. These somehow affect the doctor's choice of an appropriate antibiotic. (Nair *et al*., 2019).It also affects the pharmacist's choice when dispensing antibiotics without prescription. For example, give a broad-spectrum antibiotic like Levofloxacin instead ofa gram-positive

antibiotic like Amoxicillin in treating strep throat. The nearly expired antibiotics affect the pharmacist's choice too, the pharmacist prefers to give the nearly expired antibiotic even it is broad-spectrum when the patient asks for an appropriate one, or when the antibiotics become nearly expired it gets donated rather than sold.(Chokshi *et al*., 2019).Other determinants related to the healthcare system in Palestine, the shortage of essential drugs and supplies by the Ministry of Health, and the health insurance is not mandatory for everyone. All this led to a decreasein the access of the patients to free health services and force them to take antibiotics without a prescription.(Giacaman, Abdul-Rahim, & Wick, 2003).

Finally,oneof the major challenges in Palestine is the political situation, the Israeli occupation affects all aspects of life in Palestine especially the health system. The economic deprivation, the isolation of villages and towns, restrictions on the Palestinian population movement, and the marginalized areas where no health services are available; all this has directly led to social disparities, affected the access of the Palestinian population to health services,and lead to self-treated by antibiotics without consulting a doctor. (Eklund, &Martensson, 2012). Understanding these determinants is important for the effective implementation of the rational use of antibiotics policy.

Since 1945, when Sir Alexander Fleming was awarded his Nobel prize, he warned against developing Penicillin resistance. (Barriere, 2015). He called for decreased antibiotics use to slow down the resistance growth. (Ventola,

2015).He said that, when someone treats his sore throat infection with Penicillin and does not take enough dose to kill the streptococci, this will give the bacteria a chance to resist Penicillin, and this problem will not stop here, the resistant bacteria will be transmitted with infection to another person who will not respond to Penicillin treatment too. (Barriere, 2015).

The increases in antibiotic consumption lead to antibiotic resistance which has many serious consequences and impacts. (Nathwani, Dryden, &Seaton, 2018).Economical impact, when no response to the first-line antibiotic, more expensive one must be used, and the long duration of treatment mainly in hospitals will increase the health services cost,(Nathwani *et al*., 2018) by increasing resource utilization like; intensive care unit, additional nursing care, diagnostic tests, isolation rooms, and post-acute care beds. (Friedman, Temkin, &Cameli, 2016).

Clinical impact, most antibiotics have many adverse effects like gastrointestinal symptoms, multi-drug resistant organism infections, renal effects, blood problems, hepatobiliary symptoms, and it rarely causes neurons problems. Sometimes fatal side effects like septicemia may happen because of multi-drug resistance bacteria. (Nathwani *et al*., 2018). A septicemia is an acute event associated with high mortality and morbidity, the world health organization had recently classified it as a global health priority.(Leal *et al*., 2019).Efforts, new steps, and new policies implementation are needed to manage these crises. (Ventola, 2015).

Chapter Two
Background

2.1 Definition

The word antibiotic means any substance that acts against a microorganism. It is derived from two Greek words, anti which means against, and biotics which means concerning life.Antibiotic is natural or synthetic compounds that act against bacteria. (Nathwani*et al*., 2018).

2.2 Function and work of the antibiotics

Antibiotics work by making changes in the essential processes in the bacteria; it can be the bacteriocidal antibiotic that kills the bacteria or the bacteriostatic antibiotic which stops the bacterial growth. (Kapoor, Saigal, &Elongavan, 2017).Antibiotics have three main targets in the bacterial cell; the cell wall, DNA and RNA synthesis pathway, and the pathway of producing proteins. Every pharmacological group of antibiotics has its specific target on the bacteria cell. (Kapoor*et al*., 2017).

2.3 Antibiotic uses

The benefits and uses of antibiotics are not only restricted to save people lives by the fight against serious infections as pneumonia, but it is also extended to play a vital role in the modern medical achievements, they are used to prevent or treat infections that occur or is probable to occur in patients with organ transplant, receiving chemotherapy, patients who have had surgeries such as cesarean sections or cardiac surgery, and they are

used in patients with chronic diseases such as rheumatoid arthritis and diabetes. (Ventola, 2015).

Antibiotics also increase life expectancy by saving lives and decreasing the mortality that is related to bacterial infections. (Ventola, 2015).In the United States, the life expectancy in 1920 was only 56.4 years, and now it is around 80 years old. In developing countries, antibiotics are successful in decreasing mortality and morbidity where sanitation is poor and where poverty-related infections are common. (Ventola, 2015).

Antibiotics changed the way we deal with infections.It should be noted that in the pre antibiotics era, amputations were mainly done to treat wound infections, where in the First World War; about 70% of wound infections were ended by amputations. (Friedman *et al*., 2016).

2.4 History and discovery of antibiotics

In ancient Egypt, China, and Greece, management of bacterial infection was documented. In 1928, Penicillin was discovered by Sir Alexander Fleming, and this was the beginning of the modern era of antibiotics, (Ventola, 2015; Aminov, 2010) which made a qualitative leap in treating bacterial infections and saved millions of lives especially in the Second World War. (Ventola, 2015).But this did not last long, by the 1950s; Penicillin resistance appeared. (Ventola, 2015).

Therefore, other Beta-Lactam antibiotics rather than Penicillin were discovered and developed. The discovery of Tetracyclin was in 1950,

Erythromycin in 1953, Methicillin in 1960, Gentamycin in 1967, Vancomycin in 1972, Imipenem and Ceftazidime in 1985, Levofloxacin in 1996, Linezolid in 2000, Daptomycin in 2003, and Ceftaroline in 2010. (Ventola, 2015).

2.5 Bacterial resistance history

The discovery of antibiotics made a sense of tranquility, that now the bacteria will go extinct. But the unexpected happens; by the use of excessive antibiotics, the bacteria become smarter and able to resist the antibiotics in many different mechanisms. (Kapoor *et al*., 2017).

The Bacteria cells become resistant to a particular antibiotic when it protects themselves against this antibiotic effect.The bacteria can do it in many ways; it can pump the antibiotic out, produce compounds that can break down the antibiotic, receive genes that can resist the antibiotic from nearby bacteria, or resistance sometimes happens by chance while the bacterial DNA makes random changes. (Kapoor *et al*., 2017).

Antibiotic resistance happens when the bacteria resist the antibiotic that was effective to inhibit the growth of this bacteria and treat any infection caused by it. (Nathwani *et al*., 2018). Antibiotic resistance considered a natural phenomenon occurs when the bacteria change in the response to the used antibiotic. (Nathwani *et al*., 2018; Stuart, 2000).

Now, resistance has been seen in almost all antibiotics.(Ventola, 2015).Where Methicillin-resistant staphylococcus aureus (MRSA) was first

reported in 1962 in the United Kingdom and 1968 in the United States. (Ventola, 2015).After that in 1972, Vancomycin was developed for the treatment of MRSA cases, despite the belief that Vancomycin resistance is difficult to occur, between 1979 and 1983 many cases of Vancomycin resistance occurred,(Ventola, 2015) which has been documented first in Japan, Europe, and the United States.(Stuart, 2000).In addition, some hospital-acquired enterococcal bacterial infections which are resistant to Vancomycin are also resistant to all antibiotics used nowadays. (Stuart, 2000).To solve this global resistance problem, many new antibiotics were developed by the pharmaceutical industry from the late 1960s to the 1980s. (Ventola, 2015).

Klebsiella, Enterobacter, Acinetobacter Bauimanii, and the opportunistic Pseudomonas aeruginosa; all are recognized with high ability to resist antibiotics and are associated with serious hospital-acquired infections, while In the community, Streptococcus Pneumoniae and many bacterial strains that cause common diseases like; pneumonia and otitis media, have acquired multidrug resistance. (Stuart, 2000).

Streptococcus Pneumonia became resistant to Penicillin, a combination of Cephalosporin and Vancomycin is recommended for the treatment of infections caused by it. Likewise, Salmonella Typhimurium which is considered anenteric bacteria has developed resistance to five different types of antibiotics, where Fluoroquinolones are the only effective treatment, and despite the belief that resistance will not easily be obtained

for Fluoroquinolones, but unfortunately, the resistance has appeared. (Stuart, 2000).

2.6 The misuse of antibiotics and related effects

Epidemiological studies found that there is a relationship between the spread of resistant bacteria strains and the overuse of antibiotics. (Ventola, 2015; Nathwani *et al*., 2018;Nair *et al*., 2019; Llor, &Bjerrum, 2014).Antibiotics are easily accessible around the world, the higher spread of online antibiotics and the illegal dispensing of antibiotics without a prescription, lead to antibiotics overuse. (Ventola, 2015).

Many causes for antibiotic resistance crises; the antibiotic miss use that has many forms; the under use of antibiotics that are mainly seen in low middle-income countries where the accessibility to healthcare services is difficult, the unnecessary use is to give an antibiotic when it is not recommended, like the use of antibiotics to treat a viral infection of the upper respiratory tract, and the inappropriate use where the dose, choice, duration of therapy, and even the route of administration is incorrect. (Ventola, 2015; Nathwani *et al*., 2018).For example; delayed antibiotic administration for patients with critical illnesses, giving the antibiotic by intravenous route rather than oral route, prescribing antibiotic for a patient with allergy to this antibiotic, not changing the treatment when the microbiological culture is ready, the dose of the given antibiotic is too low or too high compared to the guidelines, and give a broad-spectrum

antibiotic or narrow-spectrum when it is unnecessary. (Nathwani *et al*., 2018).

Inappropriate use of antibiotics is common around the world, they found that choosing the right antibiotic or the duration of antibiotic treatment is wrong in 30% to 50% of conditions, and a study conducted in the United States showed that only 7.6% of 17435 patients diagnosed with community-acquired pneumonia have pathogen. (Ventola, 2015).

Another cause is the extensive agriculture use, antibiotics are widely used in livestock around the world as growth supplements and to prevent infections, using antibiotics in livestock is seemed to produce larger yields, more products quality, and improve the animal's health. In the United States alone, antibiotics used in animals counted for about 80% of total antibiotics sold. (Ventola, 2015).

Antibiotics used in animals are transferred to humans when they ingest food, also resistant bacteria can reach humans when they consume meat products, where these Resistance bacteria can cause infections in the human body and cause bad adverse effects. (Ventola, 2015).

The use of antibiotics in livestock does not affect only humans but it also affects the environment, about 90% of total antibiotics used in livestock are found in their stool and urine, and then spread through ground-water, fertilizer, and surface runoff. (Ventola, 2015).

One of the recent causes for the resistance crises is that the number of new antibiotics is limited, the past strategy of development of new antibiotics to face the resistant bacteria is now stalled due to many political, regulatory, and economic barriers. (Power, 2006).

Antibiotic investment for pharmaceutical companies is no longer desirable because antibiotics are mainly curative in a short period, so they are not profitable as other drugs used for chronic illnesses such as asthma. (Power, 2006).

In addition, once a new antibiotic is developed and marketed, the medical physicians prefer to prescribe the old agents and keep this new antibiotic for the worst cases and this leads to reduce the sale of the new antibiotic and a diminished return on the pharmaceutical investment. (Ventola, 2015.)

2.7 Statistics around the world

Many global initiatives and surveillance reports have been done, including data about antibiotic consumption rate, resistance data, and antibiotic resistance health and economic burden, where the World Health Organization has taken the lead in this issue. (Nathwani *et al*., 2018).

The global increase in the use of antibiotics over the years 2000 to 2010 is estimated by 35%, this overall increase has been counted more in low and middle-income countries. Three countries have achieved the highest numbers in antibiotics consumption, United States, China, and India, whereas 76% of the global increase was found in Russia, India, China,

South Africa, and Brazil, and the consumption of Penicillins and Cephalosporins form about 60% of overall global consumption of antibiotics. (Nathwani*et al*., 2018).

The major use of antibiotics occurs in the community, where the prevalence of antibiotics use differs from one country to another and it varies from 20% or less to more than 40% of the population takes one antibiotic every year, whereas, in the US, Canada, Australia, and Europe; general practitioners hold the highest percentage of prescribing antibiotics in the community.(Nathwani *et al*., 2018).

Using antibiotics in winter months is common around the world especially for colds, influenza, and other upper respiratory tract infections that are mainly viral and antibiotics should not be an option of treatment. (Nathwani *et al*., 2018).

Penicillins are the most antibiotics used in the community with 30-60% of total community use, while the use of other antibiotics differs between countries, for example, in Germany, the total community use of Cephalosporins is 22% compared to only 0.2% in Denmark. (Nathwani *et al*., 2018).

2.8 WHO global action plan and antimicrobial stewardship (AMS)

InMay 2015, the world health organization (WHO) supported a global action plan to face antimicrobial resistance that includes antibiotic

resistance. (World Health Organization, 2015).The goal of the global action plan as listed by the WHO is:

“To ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality-assured, used responsibly, and accessible to all who need them.” (World Health Organization, 2015, para. 2)

To achieve this goal, the WHO identified five objectives: to increase the awareness in antimicrobial resistance, encourage surveillance and research, decrease infections happening, optimal antimicrobial use, andimprove the economic case that takes into consideration all countries, to increase investment in the vaccine, new medicines, and other interventions. (World Health Organization, 2015).

To support countries in the achievement of the fourth strategic objective in the global action plan, that aimed to optimize antimicrobial use. The WHO adopted and developed the antimicrobial stewardship (AMS) program. (Smith, &Paulin, 2019).

AMS is the optimal use of antimicrobial medicines including antibiotics by giving the patient with the right diagnosis, the correct antibiotic with the least harm at the right dose, time, and route of administration. (Nathwani *et al.*, 2018).AMS is one of the essential components of the health system approach. (Smith, &Paulin, 2019)

In 2017, the WHO has developed the AWaRe classification framework for antibiotics. This classification facilitates and improves antibiotic use through AMS. It is also important as a tool for AMS, to reduce antimicrobial resistance at a local, national, and global level. (World Health Organization, 2019).

AWaRe classifies antibiotics into three groups: Access, Watch, and reserve antibiotics, to underline their optimal uses and possibility to develop resistance.The Access group includes 48 antibiotics that act against a wide range of commonly susceptible pathogens with a lower possibility to develop resistance compared with antibiotics in other groups. (World Health Organization 2019).

The Watch group antibiotics are considered as higher resistance potential, including 110 critically important antibiotics, where 11 of which are listed as essential medicines that should be the first or second choice of treatment for specified infectious diseases. The Watch group should be prioritized in the stewardship programs. (World Health Organization, 2019).

The Reserve group contains 22 antibiotics that should be used as the last choice of treatment with suspected or confirmed infections with multi-drug bacterial resistance. (World Health Organization, 2019).

A study was conducted to assess the consumption of the WHO AWaRe classification of antibiotics in 76 countries around the world, between the years 2000 and 2015. For each country, the Access to Watch index was calculated by measuring the proportion of antibiotic use for every group,

then, calculating the ratio of Access to watch antibiotics. The results showed that in this period, the increase in the consumption ofthe Watch antibiotics group was 90.9% compared to only 26.2% in the Access antibiotics group. This noticeable increase in the Watch antibiotics group was higher in Low- and middle-income countries compared to high-income countries. The access to watch index was decreased by 16.7% in high-income countries and 46.7% in low- and middle-income countries, where the global decrease of the Access to Watch index was 38.5%.The WHO national level target for the total consumption in the access antibiotics group by 2023 should be at least 60%. In this study of the WHO, the proportion of countries that reached the national level target of the WHO for the Access group of antibiotics decreased from 50 of 66 involved countries in the year 2000 to 42 of 76 involved countries in the year 2015. The findings of this study reflect a big challenge in the total consumption of antibiotic stewardship. (Klein *et al*., 2020)

2.9 Problem statement

Antibiotic resistance is now one of the major threats to global health. It reached a high level in all countries around the world. Many types of research and studies are conducted in many countries to assess and fight this problem. In Palestine, the antibiotic resistance problem appears to be strong in the last years. Antibiotics overuse and misuse made the spread of resistance worse. Although the regulations in Palestine prevent dispensing antibiotics without a medical prescription, Palestinian patients can obtain

antibiotics without a prescription from many sources, and there are over-prescribed antibiotics by health practitioners. There is an urgent need to change the way we use antibiotics, and many studies should be conducted in Palestine regards antibiotic resistance.

2.10 Significance of the study

This study is important to highlight the antibiotic resistance problem which is a serious fatal problem in Palestine.In this study, I will determine the determinants of antibiotic misuse by Palestinian pharmacists, and give recommendations to reduce and fight this misuse. The results of this study will be shownto the policy-makers in Palestine and the involved people, where steps and actions should be taken at all levels to control antibiotics dispensing without a prescription and encourage the appropriate useto slow down the progress of antibiotic resistance problem.

2.11 The aim of the study

The study aims to find out the determinants of antibiotic dispensing practices among pharmacists in West Bank communitypharmacies and to assess if the pharmacies are adherent to regulations and policy concerning dispensing antibiotics without medical prescription.

2.12 The Objectives

1. Find out the most prescribed antibiotics without prescription in West Bank.

2. Determine the most symptoms for which the pharmacists dispense antibiotics without a prescription.

3. Assess the pharmacists' knowledge regarding antibiotic resistance and their policy of use.

4. Find out the determinants of dispensing antibiotics without prescription.

2.13 Hypothesis

- Is there a difference in practice in dispensing antibiotics without prescription between districts?

- Is being the owner of the pharmacy or not affecting dispensing antibiotics without a prescription?

- Are the pharmacist's experience affect dispensing antibiotics without a prescription?

- Is there a difference in practice in dispensing antibiotics without prescription between being on the daytime shift, evening shift, or both?

- Does the pharmacist's knowledge regarding the antibiotic policy of use affect dispensing antibiotics without a prescription?

- Does the pharmacist's knowledge about the antibiotic resistance problem affect dispensing antibiotics without a prescription?

Chapter Three
Literature review

Antibiotics had recently become the most prescribed medications worldwide because of the global overuse that lead to the development of the global serious antibiotic resistance problem. (Farah, Lahoud, Salameh, &Saleh, 2015; Auta*et al*., 2019).Despite that antibiotics are often categorized as prescription-only medicines, they can be dispensed without prescription from many pharmacies in different countries around the world.(Dameh, Norris, & Green, 2012).The economic growth and easy access to antibiotics play an important role in the increase in global prescription or non-prescription antibiotics consumption,(Auta*et al*., 2019).All of this has been linked to the major public health antibiotic resistance problem.(Farah*et al*., 2015; Cheaito, Azizi, Saleh, &Salameh, 2014; Auta*et al*., 2019;Zapata-Cachafeiro*et al*., 2014).

A study conducted in Lebanon showed that 41% of antibiotics prescribed without a prescription by pharmacists were not helpful because the disease was mainly viral or non-infectious,(Farah *et al*., 2015), and patients mainly recovered without the use of any antibiotic.(Cheaito *et al*., 2014).

The irrational use of antibiotics leads to many consequences including; increase in resistance to antibiotics, (Auta *et al*., 2019; Dameh *et al*., 2012; Bin Abdulhak*et al*., 2011). Masking the true diagnosis of many infectious diseases so delayed the early medical intervention and admission to the hospital,(Auta, 2019).it also increases the cost of treatment, (Farah *et al*.,

2015; Dameh et al., 2012; Bin Abdulhak*et al*., 2011; Bahnassi, 2015).Because of the need for a higher price of broad-spectrum antibiotics and extra visits to a physician clinic.(Al-Mohamadi, Badr, Bin Mahfouz, Samargandi, & Al Ahdal, 2013). And finally, this irrational use leads to an increase in the exposure to drug side effects,(Bin Abdulhak et al., 2011). where anaphylaxis is considered a serious side effect for many antibiotics. Therefore, the pharmacist should always ask about allergies.(Bahnassi, 2015).

A previous cross-sectional study conducted in Riyadh, Suadi Arabia, with a random sample of 327 pharmacies, aimed to investigate the antibiotics prescribed by pharmacists without a medical prescription for specific illnesses, and the results showed that pharmacists dispensed antibiotics without prescription in 77.6% of the total sample, of which 95% were prescribed without request from the patient, where, diarrhea and sore throat were the most illnesses for which pharmacists prescribe an antibiotic followed by urinary tract infections. In this study, none of the participating pharmacists ask the patient about allergies. (Bin Abdulhak *et al*., 2011).

About 2 million infections and 23000 deaths every year in the USA because of antibiotic resistance, and despite the lack of data in developing countries regarding antibiotic resistance infections, it is still causing many deaths annually in these countries, in India, about 57000 neonatal deaths occur every year because of sepsis due to antibiotic-resistant infections.(Auta *et al*., 2019).

Many studies discussed the relationship between antimicrobial resistance and antibiotic misuse.(Cheaito *et al*., 2014; Zapata-Cachafeiro*et al*., 2014; Bin Abdulhak*et al*., 2011).The development of resistant bacteria because of inappropriate use will decrease the normal flora's ability to resist the harmful microorganism so leading to multi-resistant bacterial infections.(Cheaito *et al*., 2014).

In many countries like Brazil, South Korea, Mexico, and Chile, the restrictions on the sale of antibiotics without a prescription were effective in decreasing the consumption of antibiotics without a prescription. (Auta *et al*., 2019).In a study performed in New Zealand regarding pharmacists experience and attitude towards the use of antibiotics without medical prescription, a sample of 35 community pharmacies was selected, and they found that selling antibiotics without a medical prescription is not common in New Zealand, pharmacists understand and aware of legislations regard dealing with antibiotics but many of them used non prescribed antibiotics for personal use and reported that in some conditions they would dispense antibiotics without medical prescription, however, the most important factors that affect pharmacists practices of dealing with antibiotics without a prescription were the legislations and the fear of being caught or reported breaking the law. (Dameh *et al*., 2012).

In developing countries, dispensing antibiotics without a medical prescription is common practice among pharmacists,(Dameh *et al*., 2012).And there are no regulations about the sale of antibiotics and if there

is a clear regulation, the enforcement of these regulations is still weak and needs to be strictly enforced like in many Arab countries. (Auta *et al*., 2019; Dameh *et al*., 2012; Bahnassi, 2015). In Syria, pharmacists think that the current legislations are not adequately enforced to stop selling antibiotics without a prescription.(Bahnassi, 2015).

A previous study conducted in Syria,aimed to investigate the pharmacist's practices in dispensing antibiotics without prescription, and a sample of 147 pharmacists was selected from three different Syrian cities, where the finding showed that all the participants pharmacists dispense antibiotics without medical prescription, and most of them think that the sale of antibiotics without a prescription will not affect patient health, and the pharmacists who did not agree with this practice felt that laws should be imposed.(Bahnassi, 2015).

Even if there is clear legislation that prevents the antibiotics sale without a medical prescription, there is a possibility to obtain it from a friend or through a family member or purchase from another country.(Bahnassi, 2015).An international survey conducted in nine developing and developed countries including; France, Belgium, Morocco, Turkey, Italy, Thailand, Colombia, United Kingdom, and Spain, showed that customers could directly purchase antibiotics without a medical prescription from pharmacists, even this considered illegal in these countries.(Dameh, 2012).

About 80% of antibiotic consumption around the world occurred in the community. (Auta *et al*., 2019; Nathwani *et al*., 2018; Bahnassi,

2015).Either purchased directly by the patients without a medical prescription or by a healthcare professional prescription.(Auta *et al*., 2019).Despite that the non-prescription of antibiotics is illegal in many countries around the world, 50% of antibiotics are obtained without a medical prescription,(Auta *et al*., 2019). and this is often associated with inappropriate selection of the antibiotic and its dose and insufficient duration of treatment. (Cheaito *et al*., 2014; Bahnassi, 2015).where community pharmacies are still the most important source of dispensing antibiotics without a medical prescription, (Farah *et al*., 2015; Auta *et al*., 2019).specially in developing countries.(Farah *et al*., 2015).In many Arab countries like Syria, Lebanon, and Saudi Arabia, the selling of antibiotics in community pharmacies without a prescription has high percentages. (Bahnassi, 2015).

Selling of antibiotics without a prescription has been reported in Europe; 22% in Lithuania, 44% in Greece, 3.5% in Denmark, the Middle East; 46% in Jordan, Africa; 100% in Uganda and Nigeria, and some Asian countries like 62% in Vietnam.(Farah *et al*., 2015). 66% of pharmacists who participated in a study performed in Spain reported selling antibiotics without medical prescription.(Dameh *et al*., 2012). A previous study performed in Damascus, Syria found that the percentage of antibiotics sold without a prescription is 89.3% which is considered very high. (Bahnassi, 2015).

A previous systematic review was conducted on 38 studies around the world in 24 countries, where the supply of antibiotics without a prescription is considered illegal in all these countries except in Thailand, all studies involved in this review were conducted in community pharmacies, and the results showed that the global estimate or the overall pooled estimate of dispensing the non prescribed antibiotics was 62%. (Auta *et al*., 2019).

Despite the variations between countries in this systematic review, the supply of antibiotics without a medical prescription is globally high, about 78% of antibiotic requests and 58% of consultation in community pharmacies lead to the sale of antibiotics without medical prescription, most of these antibiotics were given for diseases that were mainly acute and self-limiting like gastroenteritis and upper respiratory tract infections. (Auta *et al*., 2019).

In the same systematic review, they found that the total pooled estimate for patients that were advised to see a physician without supplying any type of antibiotics was 2%. The nature of pharmacists counseling the patients during the consultation was; asked about allergy 32% in 10 studies, asked about other medications the patient is taking was 12% in 6 studies, asked about pregnancy status was 8% in 4 studies, and explained the right duration to take the antibiotic was 49% in 12 studies.(Auta *et al*., 2019).

Pharmacists hardly refuse to dispense antibiotics without a prescription and most of them do not ask about justification even if the customer seems

healthy.(Al-Mohamadi *et al*., 2013).Pharmacists usually like to dispense antibiotics without a prescription to their regular customers, relatives, (Zapata-Cachafeiro*et al*., 2014; Bahnassi, 2015) and to patients who took the antibiotic before.(Bahnassi, 2015). They give this practice many reasons, one reason is that pharmacists always want to achieve patient satisfaction and they believe that the patient can buy the antibiotic from any other pharmacy. (Dameh *et al*., 2012; Zapata-Cachafeiro*et al*., 2014; Bahnassi, 2015). Another reason is the reuse of an antibiotic; pharmacists usually do not ask for the reason to reuse the same antibiotic the patient use before. (Bahnassi, 2015).Some pharmacists are aware of an antibiotic refill especially if it had not worked before.Also, pharmacists mainly feel comfortable when they dispense any antibiotic to their relatives or friends because they can get follow up with them easily, and Pharmacists feel that they are qualified to dispense antibiotics to pediatric patients and they justify themselves that if the antibiotic does not help it will not cause real harm. (Bahnassi, 2015).

Pharmacists usually refuse to dispense antibiotics without a prescription to pregnant women, they only dispense Amoxicillin or Ampicillin because of their safety in pregnancy, they feel a moral responsibility to advise the pregnant women to ask a physician before taking any type of antibiotics.(Bahnassi, 2015).

Pharmacists are considered the main helper for patients who prefer to take antibiotics by self-medication and pharmacies are the main source.(Cheaito

et al., 2014).In a study conducted in Jeddah, Saudi Arabia, with a random sample of 60 pharmacies, they found that about 97.9% of pharmacists accept to dispense the antibiotic immediately after a patient request, and this dispensing without a prescription exacerbates the antibiotic resistance problem.(Al-Mohamadi *et al*., 2013).

Azithromycin, Amoxicillin, Amoxicillin and Clavulanic acid, and Fluoroquinolones, all are broad-spectrum antibiotics that are mainly supplied without a medical prescription, these antibiotics have been classified as "critically important antibiotics" by the world health organization; they are used in the treatment of serious infections and if the resistance to these antibiotics happened this will lead to a life-threatening condition. Note that the risk of antibiotic resistance to happen increases with the use of broad-spectrum antibiotics. (Auta *et al*., 2019).

The most common reason for people self-medication with antibiotics is to save time and money, people may ask pharmacists for antibiotics mainly for nasal congestion, urinary discomfort, teeth and gum problems, bronchitis, influenza, and throat symptoms. (Cheaito *et al*., 2014).

The main antibiotic classes that were significantly found with patient self-medication were Amoxicillin and Clavulanic acid or Amoxicillin alone in a study performed in Lebanon, and the same results from studies conducted in Jordan, the United Arab Emirates, and Sudan, where in Europe, the most commonly used antibiotics are Penicillins followed by Cephalosporines, then Tetracycline, then Macrolides and Quinolones, it should be noted that

the reason for the use of Amoxicillin without prescription in high percentage because of its low cost and does not have uncomfortable side effects like other antibiotics. (Cheaito *et al*., 2014).

People are not aware of the risk of antibiotics over-use, the majority of people using the antibiotic to relieve the symptoms of upper respiratory tract viral infections, and this finding in a study conducted in Lebanon is in line with the results of studies in Abu Dhabi, Greek, Jordan, and Europe. (Cheaito *et al*., 2014).

A few studies have focused on pharmacists self-prescribing of antibiotics for themselves or to their families, for example; a study conducted in the United States found that 79% of participating pharmacists reported antibiotics self-prescribing without medical prescription, reasons for this pharmacists practice are the lack of time, the pharmacists believing that the medical physicians would prescribe the same antibiotic they chose, and the long-lasting hours of working in the pharmacy might encourage the pharmacist's self-prescribing practice. (Dameh *et al*., 2012).

A previous study conducted in Lebanon showed that there is a significant difference in dispensing antibiotics without a prescription between high and low socioeconomic areas. This study found that patients asked pharmacists to dispense antibiotics without a medical prescription more frequently in lower socioeconomic regions than in higher regions, where the total number of antibiotics sale without a medical prescription was higher in the lower socioeconomic areas.In both regions, the main reason for dispensing

antibiotics without a medical prescription was that the patient cannot afford a physician clinic. (Farah *et al*., 2015).

Pharmacists dispense antibiotics without a prescription for specific disease conditions. (Farah *et al*., 2015).Symptoms of Gastroenteritis like diarrheal diseases and urinary tract infections are the most conditions where pharmacists prescribe antibiotics without a prescription. (Farah *et al*., 2015; Auta *et al*., 2019). Pharmacists also prescribe antibiotics for respiratory symptoms. (Farah *et al*., 2015).

Ciprofloxacin and Norfloxacin are the most common antibiotics given for urinary tract infections. (Auta *et al*., 2019).In a study conducted in Greece, 69% of participating pharmacists dispensed antibiotics without medical prescription for a case of rhinosinusitis with fever and 86% of them dispensed antibiotics without medical prescription for rhinosinusitis without fever. (Dameh *et al*., 2012). A study performed in Saudi Arabia found that Amoxicillin and Clavulanic acid was the most prescribed antibiotic for otitis media, acute bronchitis, sinusitis, sore throat, whereas Ciprofoxacin was commonly given for urinary tract infections and Metronidazole for diarrhea cases. (Bin Abdulhak *et al*., 2011).

Most actions regarding this global irrational use of antibiotics are directed toward physician prescriptions while neglected by the other sources. (Bin Abdulhak *et al*., 2011).A study in Saudi Arabia showed that some pharmacists think that antibiotics do not cause any harm to patients, and they mentioned that they have good information to dispense any drug for

the medical condition. It must be noted that pharmacists only have the right to dispense over the counter medications like some pain killer and to advise the patients to visit a medical practitioner if he felt that the patient has bad symptoms and need an antibiotic. (Al-Mohamadi *et al*., 2013).

Chapter Four
Methodology

4.1 Study design

A cross-sectional descriptive study was used to assess the community pharmacies' contribution to the antibiotic resistance problem and the overuse of antibiotics.

4.2 Population, sample size, and sampling technique

The participants were pharmacists working in West Bank community pharmacies with a bachelor's degree at least.

A list of pharmacies was taken from the Palestinian pharmacists association, andthere are 1096 community pharmacies distributed throughout the West Bank. A representative sample of 285 registered community pharmacies has been selected out of the total available pharmacies from the list. The sample was determined using the Raosoft size calculator, with a response distribution rate of 50%, where the accepted margin of error is 5% at the 95% confidence level.

Stratified random sampling method was used to select the pharmacies from each district using the proportion method to calculate the sample size from each one depending on the total number of pharmacies in that district; Nablus(44 pharmacies), Ramallah(44 pharmacies), Jenin(39 pharmacies), Beitlahm(24 pharmacies), Hebron (64 pharmacies), Salfit (9 pharmacies), Jericho (5 pharmacies), Jerusalem (25 pharmacies), Qalqilya (13

pharmacies), and Tulkarm (23 pharmacies). Then the Pharmacies were randomly chosen from each districts using a convenience sample method.

4.3 Inclusion and exclusion criteria

Pharmacists to be included in this study should be the owners of the pharmacy or an employee with full-time work. Pharmacy assistants, pharmacy students, and pharmacists who work part-time were excluded.

4.4 Data collection tool

The self-administrative questionnaire was used to collect the data. See (annex 1).It was adopted and modified from previous studies to suit the Palestinian pharmacist's circumstances and environment. (Farah et al., 2015; Bahnassi, 2015). The questionnaire consisted of a list of questions divided into seven parts.

1. The first part is demographic and social data included questions about personal and professional information like pharmacist year of graduation, work experience, and age. Where the demographic data to locate the pharmacy. (annex 1)

2. The second part; the daily antibiotics dispensing practices, was yes or no questions, statements with 3 or 5 Likert scale answers, multiple-choice questions, and dropdown questions, to assess pharmacist knowledge and attitude about dispensing antibiotics without prescription. (annex 1)

3. The third part was the determinants for dispensing antibiotics without a prescription, with two multiple-choice questions, to find out the reason for dispensing antibiotics without a prescription and the basis the pharmacist depends on when choosing a particular antibiotic for the patient. (annex 1)

4. The fourth part was assessing the pharmacist's knowledge about antibiotics and antibiotic resistance problems using 3 yes or no questions. (annex 1)

5. In the fifth part, pharmacists were asked to fill out a table with yes or no questions about the symptoms of infections provided by patients for which they prescribe antibiotics, they answered for each symptom to indicate whether they refer to a doctor or give an antibiotic. To find out the most symptoms for which the pharmacists prescribe antibiotics without a prescription. (annex 1)

6. The sixth part was assessing the most commonly prescribed antibiotics without a medical prescription in West Bank. The pharmacists were asked to fill out a table of Likert scale points for each antibiotic about the frequency of dispensing without a prescription. (annex 1)

7. Seventh part, laws, and legislation-related data. To determine the pharmacist's knowledge regarding the policy of using antibiotics. (annex 1)

4.5 Field work

A list of Pharmacies, addresses, and telephone numbers has been requested by a phone call from the Palestinian pharmacists association. The list was sent to me by email.

Data collection took place between April – June. 2021. An online questionnaire was sent by social media like Whatsapp, pharmacists groups, and pages on Facebook. Unfortunately, few numbers replied to messages and fulfilled the questionnaire, which led me to redistribute the questionnaire by visiting the selected pharmacies. For some pharmacies the questionnaire was fulfilled directly, for others it was left there to come back and collect them later.

4.6 Validity and reliability

The questionnaire was adopted and modified from previous studies as listed above, it was translated to Arabic. To ensure reliability, experts review and pilot study was performed, 29 pharmacies that represent 10% of the total sample size were chosen randomly from the Nablus district, and the time used to fulfill the questionnaire was nearly from 10-15 minutes. Few modifications were requested. Cronbach's alpha equals 0.904.

4.7 Statistical analysis

SPSS version 19 was used to analyze the data. The dependent variable is dispensing antibiotics without a prescription, where the independent variables are being the owner of the pharmacy, the pharmacist experience,

the geographical location, being on daytime or night shift, pharmacist knowledge regards antibiotics and antibiotic resistance, profitable financial reason, and pharmacist knowledge regards antibiotics policy of use.

Dispensing antibiotics without prescription is the dependent variable that refers to selling antibiotics for the customer or the patient without medical prescription depending on the pharmacist's opinion and experience or depending on the patient's request. The measurement of this dependent variable is based on the pharmacist's answers the part two of the questionnaire. (Annex 1)

A Chi-square test was done to find out any association between dispensing antibiotics without prescription and the independent variables. Note that in all tests, if $p<0.05$ then significance will be determined.

Table 1: Conceptual and operational definitions of study variables

The independent variables	Conceptual definition	Operational definition
Pharmacist knowledge regards antibiotic-resistant.	The information that the pharmacist knows about antibiotics and their bacterial resistance effect.	Based on the pharmacist's answer for the fourth part of the questionnaire. Questions 20,21,22; Yes or no questions. (Annex 1) The pharmacist should give 3 right answers to be considered with excellent knowledge, 2 right answers to be considered with good knowledge, and only one or no right answer to be considered with poor knowledge.
Profitable and financial reasons	Reasons that related to financial profit or money which the pharmacist earns from selling antibiotics without prescription.	Based on 5 particular answers from questions 19 and 20 in the questionnaire. (Annex 1) If the pharmacist choose 4 or 5 answers, then the profitable reason will be considered as Extremely high reason for him, 2 or 3 answers will be considered as high reason, and 1 or no answer will be considered as low reason.

Pharmacist knowledge regards antibiotics policy of use.	The information that the pharmacist knows regards the legislation and laws that control antibiotic dispensing without prescription.	Question 27 in the seventh part on the questionnaire. Yes or no question. (Annex 1)

4.8 Ethical consideration

The study was approved by the institutional review board in An Najah National University (Annex 2). Informed consent was used to ensure the acceptance of participant pharmaciststo participate in the study, who were informed about their right to refuse or withdraw from the study. Study data was treated with high confidentiality; no one has the access to it.

Chapter Five

Results

This chapter discussed the findings of the study. The total sample was calculated to be 285, while the return back was about 97.2% of the total sample, due to that some questionnaires were not fully answered and excluded.

5.1 Descriptive statistics

Table 2: Distribution of participants percentage according to their demographic data.

Variable	category	No.	%
Age	Less than 30 30 – less than 40 40 – less than 50 More than 50 Total	137 74 51 15 277	49.5 26.7 18.4 5.4 100
Gender	Male Female Total	118 159 277	42.6 57.4 100
Experience in years	1-5 6-10 More than 10 Total	130 58 89 277	46.9 20.9 32.1 100
Owner of the pharmacy	Yes No Total	85 192 277	30.7 69.3 100
Work shift	Morning Evening Both Total	118 61 98 277	42.6 22 35.4 100
Address	Jenin Nablus Ramallah Jerusalem Hebron Beitlahm Tulkarm Qalqelia Jericho Salfeet Total	39 58 44 27 46 22 21 13 3 4 277	14.1 20.9 15.9 9.7 16.6 7.9 7.6 4.7 1.1 1.4 100

The total number of participants was 277 pharmacists distributed over districts. The percentage of male participants was 42.6%, while the percentage of females was 57.4%. The age groups were distributed as follows: 49.5% were less than 30, 26.7% were from 30-less than 40, 18.4% were from 40-less than 50, and 5.4% were more than 50. The participants of young age groups are higher than others.

The numbers of years of work experience for the participants were divided into 3 groups: 46.9% from 1-5 years, 20.9% from 6-10 years, and 32.1% were more than 10 years. 30.7% of the participants own the pharmacy, where 69.3% were not. Also, the participants were distributed according to their working shift: 42.6% were on the morning shift, 22% were on the evening shift, and 35.4% were on both morning and evening shifts as shown in Table 1.

Table 3: Distribution of participants percentage according to their practices in dispensing antibiotics without prescription.

Variable	Answers	No.	%
Q1. Dispensing antibiotics without prescription	Yes No total answers	261 16 277	94.2 5.8 100
Q4. If the pharmacist asks the patient about the cause of request an antibiotic	Yes No total answers	247 13 260	89.2 4.7 93.9
Q6. Dispensing injections of antibiotics without prescription	Yes No sometimes total answers	6 238 17 261	2.2 85.9 6.1 94.2
Q7. Dispensing a combination of antibiotics without prescription at the same time	Yes No sometimes total answers	2 233 26 261	0.7 84.1 9.4 94.2
Q8. Dispensing antibiotics without prescription for infants	Yes No sometimes total answers	15 223 23 261	5.4 80.5 8.3 94.2

Q9. Dispensing antibiotics without prescription for children 1-12years	Yes	95	34.3
	No	38	13.7
	sometimes	128	46.2
	total answers	261	94.2
Q10. Dispensing antibiotics without prescription for adults less than 60years	Yes	132	47.7
	No	13	4.7
	sometimes	116	41.9
	total answers	261	94.2
Q11. Dispensing antibiotics without prescription for elderly more than 60years	Yes	90	32.5
	No	53	19.1
	sometimes	118	42.6
	total answers	261	94.2
Q12. Dispensing antibiotics without prescription for relatives and friends	Yes	125	45.1
	No	29	10.5
	sometimes	107	38.6
	total answers	261	94.2
Q13. Dispensing antibiotics without prescription for pregnant women	Yes	45	16.2
	No	172	62.1
	sometimes	44	15.9
	total answers	261	94.2
Q14. Repeat dispensing antibiotic without prescription for the patient	Yes	37	13.4
	No	133	48
	sometimes	91	32.9
	total answers	261	94.2
Q15. Dispensing Amoxicillin antibiotic without prescription for a patient who has flu-like symptoms	Yes	26	9.4
	No	196	70.8
	sometimes	39	14.1
	total answers	261	94.2
Q16. Dispensing incomplete course of antibiotic without prescription	Yes	104	37.5
	No	66	23.8
	sometimes	91	32.9
	total answers	261	94.2
Q17. The pharmacist gives information about the dispensed antibiotic	1.Always	198	71.5
	2.very often	65	23.5
	3.Sometimes	12	4.3
	4.Rarely	0	0
	5.Never	2	0.7
	total answers	277	100
Q3. Dispensing antibiotics upon patient request	1.Always	36	13
	2.Sometimes	193	69.7
	3.Never	32	11.6
	Total answers	261	94.2
Q5. If the pharmacist prescribe antibiotics by himself	1.Always	44	15.9
	2.Sometimes	197	71.1
	3.Never	20	7.2
	total answers	261	94.2
Q2. Frequency of dispensing antibiotics with and without prescription per day	Less than 10	168	60.6
	10-30	91	32.9
	More than 30	18	6.5
	Total answers	277	100

94.2% of participant pharmacists sometimes dispensed antibiotics without prescription and only 5.8% of the participants did not dispense antibiotics without a prescription. This high rate of self-prescribing antibiotics reveals frequent misuse of antibiotics, which indicates a disastrous situation that will accelerate the antibiotic resistance problem.

Table 2 showed that the total number of daily prescribed antibiotics with and without prescription was less than 10 with 60.6% of participants, from 10-30 with 32.9% of participants, and more than 30 with 6.5% of total participants. 13% of the participants were always dispensing antibiotics upon patient request, where 69.7% answered with sometimes, and only 11.6% were never. Whereas, 89.2% of the participant pharmacists asked the patient about the cause of requesting an antibiotic.

Table 2 also showed that 7.2% of participants would never prescribe antibiotics by themselves, were 15.9% and 71.1% of them always and sometimes respectively prescribed antibiotics by themselves. 84.1% have never dispensed a combination of antibiotics without prescription.

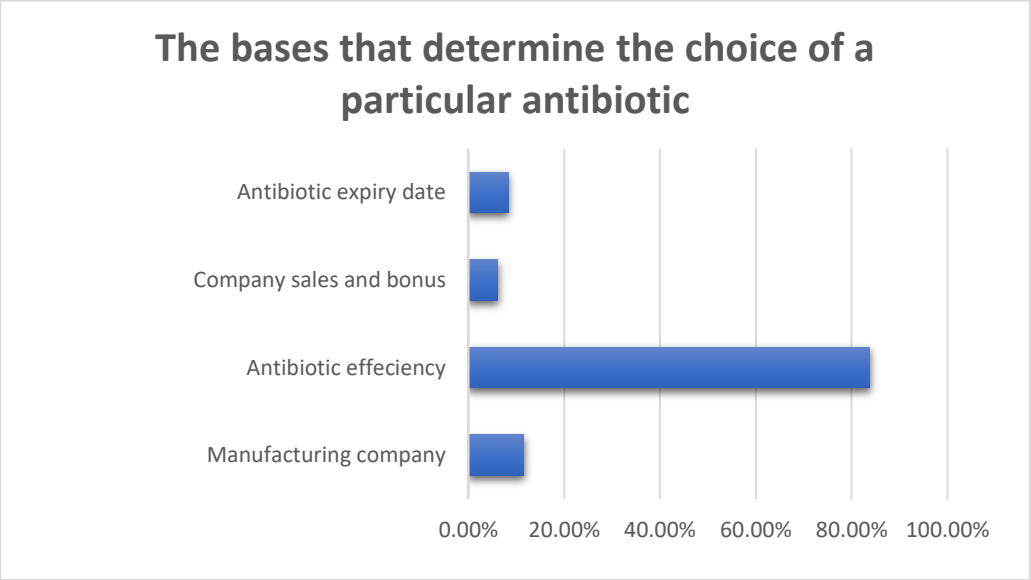
It is good to note that 17% of participants were sometimes dispensing injections of antibiotics without prescription. And 37.5% of participants were always dispensing incomplete course of antibiotics without prescription, where 32.9% did this sometimes.

Table 4: Distribution of participants percentage according to the determinants they depend on to give an antibiotic.

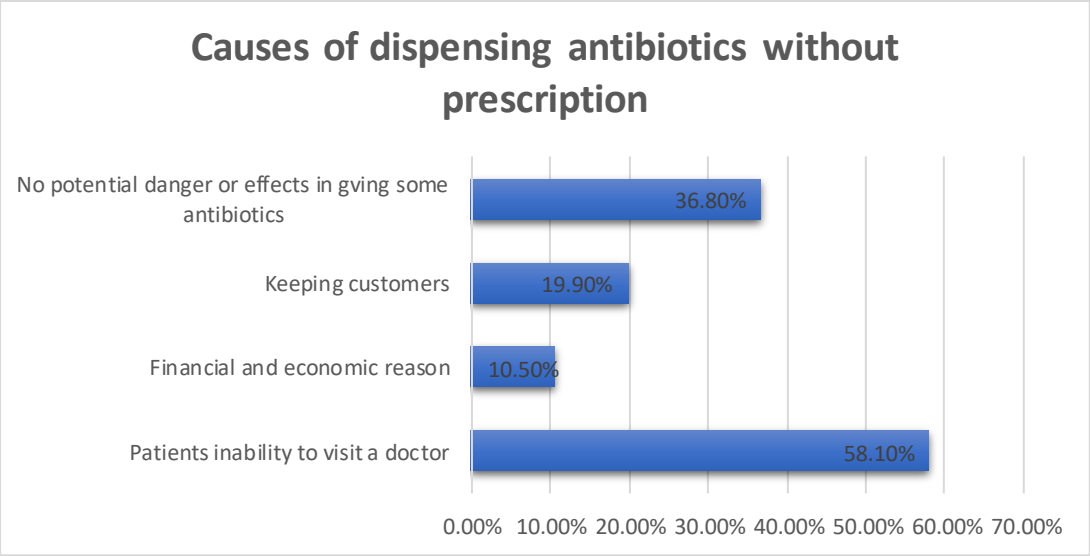
Variable	answers	Yes No. (%)	No No (%)	Total answers No. (%)
Q19. The bases that determine the choice of a particular antibiotic	1.Manufacturing company	32 (11.6)	229 (82.7)	261 (94.2)
	2.Antibiotic efficiency	232 (83.8)	29 (10.5)	261 (94.2)
	3.Company sales and bonus	17 (6.1)	244 (88.1)	261 (94.2)
	4.Antibiotic expiry date	23 (8.3)	238 (85.9)	261 (94.2)
Q20. Causes of dispensing antibiotics without prescription	1.Patients inability to visit a doctor	161 (58.1)	100 (36.1)	261 (94.2)
	2.Financial and economic reason	29 (10.5)	232 (83.8)	261 (94.2)
	3.Keeping customers	55 (19.9)	206 (74.4)	261 (94.2)
	4.No potential danger or effects in giving some antibiotics	102 (36.8)	159 (57.4)	261 (94.2)

Table 3 showed that 83.8% of the participants based on the efficiency of the antibiotic when choosing a particular one, only 6.1% based on the company sales and bonus.

It also showed the causes of dispensing antibiotics without prescription, it revealed that 58.1% of participants prescribed it due to the inability of the patient to visit a doctor, while only 10.5% of them payed attention for financial profit.



Figuer 1: The bases that determine the choice of a particular antibiotic.

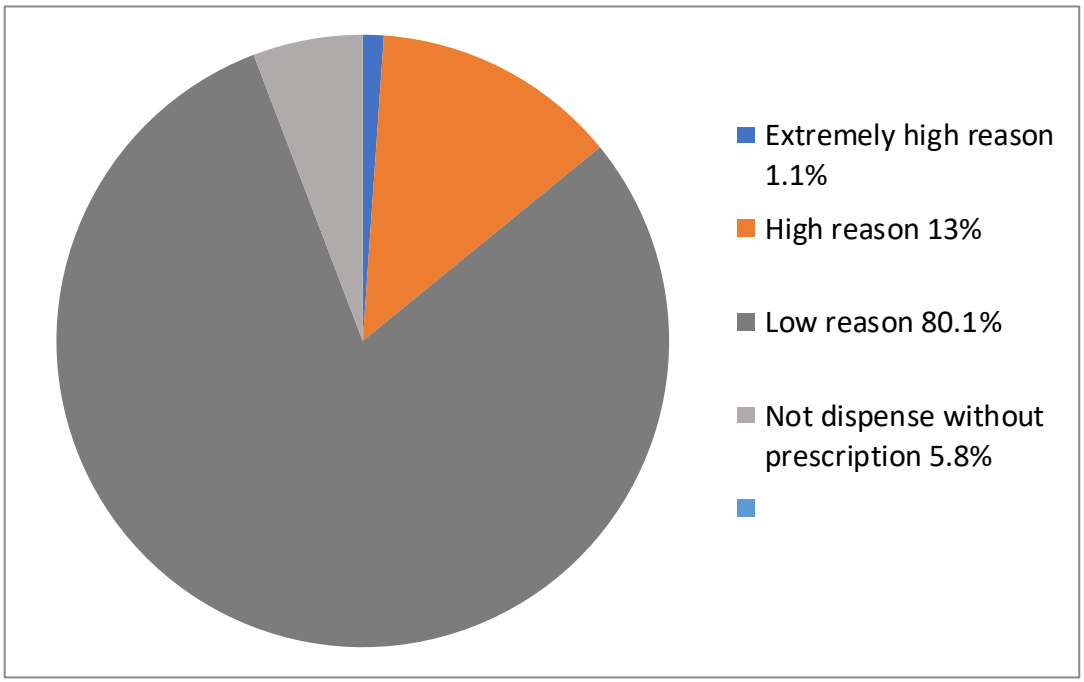


Figuer 2: The causes for dispensing antibiotics without prescription.

Table 5: Distribution of participants percentage according to profitable financial reasons.

Profitable financial reasons	Pharmacists dispensing antibiotics without prescription no. (%)
Extremely high reason	3 (1.1)
High reason	36 (13)
Low reason	222 (80.1)
Total	261 (94.2)

Table 4 showed that profitable and financial reasons considered as low reasons for dispensing antibiotics without prescription for 80.1% of participant pharmacists and only 1.1% considered it as extremely high reason.



Figuer 3: Participants percentage according to the profitable financial reason in dispensing antibiotics without prescription.

Table 6: Distribution of participants percentage according to their knowledge regards antibiotic resistance.

Variable	answers		
	Yes No. (%)	No No. (%)	Total answers No. (%)
Q21.If the pharmacist know about the antibiotic resistance problem	268 (96.8)	9 (3.2)	277 (100)
Q22.Antibiotic resistance is a serious fatal problem	243 (87.7)	34 (12.3)	277 (100)
Q23.Antibiotic resistance occurs mostly in old ages more than young ages	151 (54.5)	126 (45.5)	277 (100)

Table5 presented that, 96.8% of participant pharmacists know about the antibiotic resistance problem, and only 3.2% of them don't know. Where 87.7% of them know that antibiotic resistance is a serious fatal problem.

Table 7: Distribution of participants percentage according to the symptoms provided by the patients for which they prescribe antibiotics.

Variable		Yes No. (%)	No No. (%)	Total answers No. (%)
Diarrhea	Child	31 (11.2)	230 (83)	261 (94.2)
	Adult	53 (19.1)	208 (75.1)	261 (94.2)
Diarrhea with fever	Child	58 (20.9)	203 (73.3)	261 (94.2)
	Adult	75 (27.1)	186 (67.1)	261 (94.2)
Diarrhea with blood	Child	23 (8.3)	238 (85.9)	261 (94.2)
	Adult	38 (13.7)	223 (80.5)	261 (94.2)
Burning sensation during urination	Child	94 (33.9)	167 (60.3)	261 (94.2)
	Adult	174 (62.8)	87 (31.4)	261 (94.2)
Burning sensation during urination with fever	Child	105 (37.9)	156 (56.3)	261 (94.2)
	Adult	173 (62.5)	88 (31.8)	261 (94.2)
Sore throat	Child	169 (61)	92 (33.2)	261 (94.2)
	Adult	207 (74.7)	54 (19.5)	261 (94.2)
Sore throat with cough	Child	166 (59.9)	95 (34.3)	261 (94.2)
	Adult	201 (72.6)	60 (21.7)	261 (94.2)
Sore throat with fever	Child	201 (72.6)	60 (21.7)	261 (94.2)
	Adult	222 (80.1)	39 (14.1)	261 (94.2)
Cough with fever	Child	121 (43.7)	140 (50.5)	261 (94.2)
	Adult	146 (52.7)	115 (41.5)	261 (94.2)
Productive cough	Child	93 (33.6)	167 (60.3)	260 (93.9)
	Adult	127 (45.8)	134 (48.4)	261 (94.2)
Cough, fever, chest pain, and shortness of breath	Child	97 (35)	164 (59.2)	261 (94.2)
	Adult	117 (42.2)	144 (52)	261 (94.2)

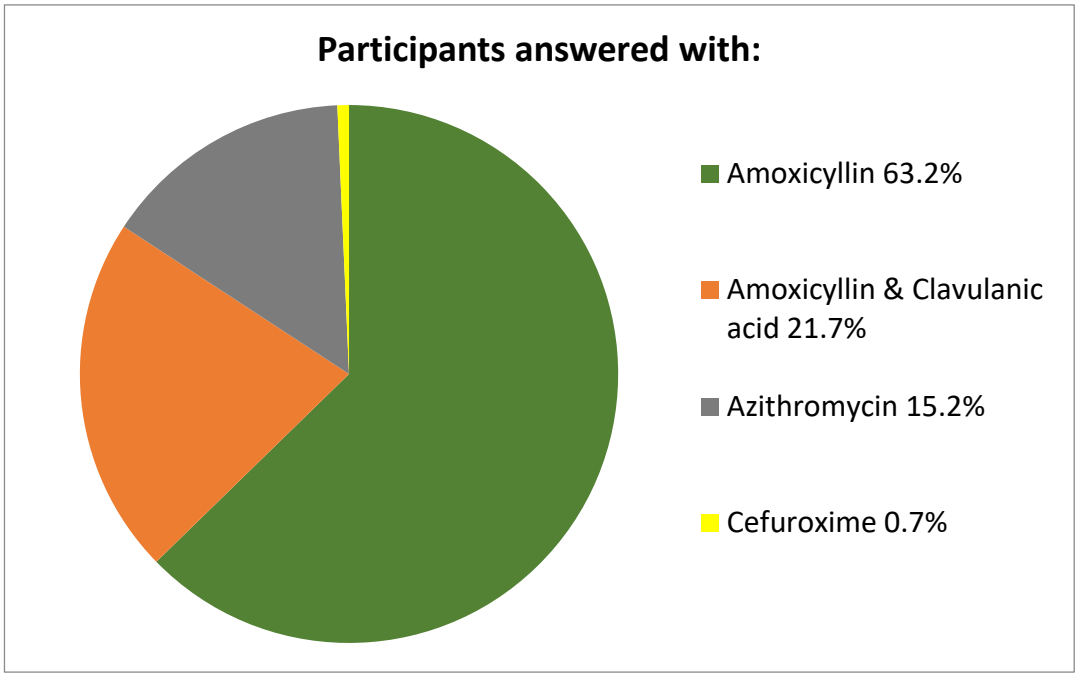
Table 6 showed that 33.9% of participant pharmacists dispense antibiotics without prescription for a child has burning during urination symptom, and 62.8% of participants dispense antibiotics without prescription for an adult with the same symptom. It also showed that 61% of participants dispense antibiotics without prescription for the child with a sore throat, where 74.7% of them dispense antibiotics without prescription for an adult with a sore throat.

The most symptoms for which pharmacists dispense antibiotics without prescription were sore throat with fever. As the percentage of participants who reported that they dispense antibiotics for children and adults with those symptoms was 72.6% and 80.1% respectively.

Table 8: Distribution of participants percentage according to the most antibiotic they dispense without prescription.

The most dispensed antibiotics	Amoxicillin No. (%)	Amoxicillin & Clavulanic acid No. (%)	Azithromycin No. (%)	Cefuroxime No. (%)
	175 (63.2)	60 (21.7)	42 (15.2)	2 (0.7)

Table 7 shows that Amoxicillin is the highest prescribed antibiotic without prescription since 63.2 % of participants reported that.



Figuer 4: The most prescribed antibiotics without prescription.

Table 9: Distribution of participants percentage according to the antibiotics they dispense without prescription.

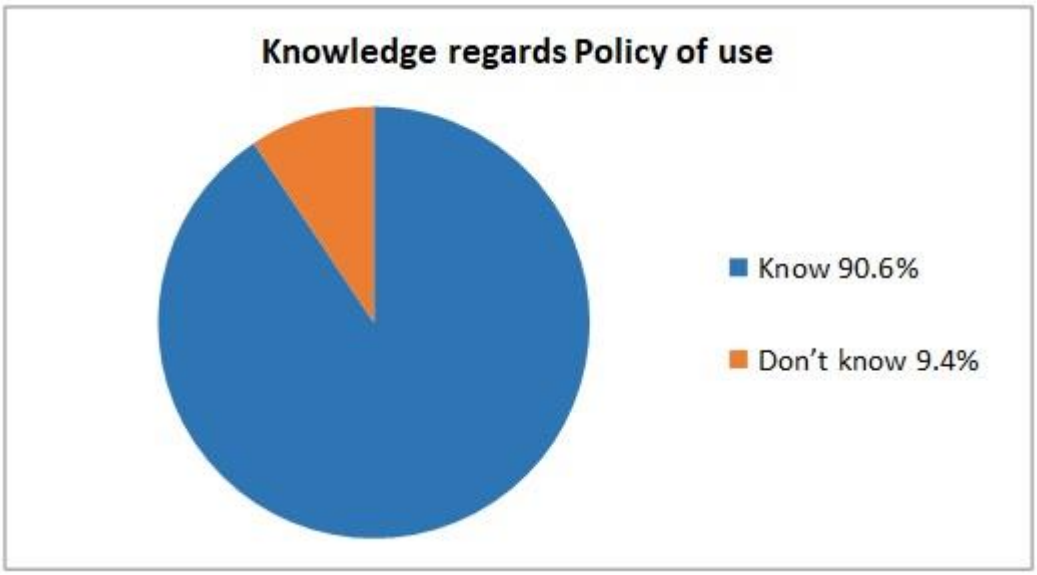
Variable		Always No. (%)	Very often No (%)	Rarely No. (%)	Never No. (%)	Total answers No. (%)
If the pharmacist dispense the listed antibiotic without prescription	Amoxycillin	75 (27.1)	135 (48.7)	47 (17)	4 (1.4)	261 (94.2)
	Cephalexin	20 (7.2)	54 (19.5)	117 (42.2)	70 (25.3)	261 (94.2)
	Cefdinir	10 (3.6)	18 (6.5)	100 (36.1)	133 (48)	261 (94.2)
	Azithromycin	61 (22)	108 (39)	76 (27.4)	16 (5.8)	261 (94.2)
	Cefadroxil	9 (3.2)	26 (9.4)	103 (37.2)	123 (44.4)	261 (94.2)
	Cefixim	10 (3.6)	27 (9.7)	91 (32.9)	133 (48)	261 (94.2)
	Ciprofloxacin	21 (7.6)	48 (17.3)	121 (43.7)	71 (25.6)	261 (94.2)
	Doxycycline	11 (4)	17 (6.1)	130 (46.9)	103 (37.2)	261 (94.2)
	Clindamycin	16 (5.8)	22 (7.9)	124 (44.8)	99 (35.7)	261 (94.2)
	Erythromycin	15 (5.4)	30 (10.8)	108 (39)	108 (39)	261 (94.2)
	Clarithromycin	14 (5.1)	30 (10.8)	102 (36.8)	115 (41.5)	261 (94.2)
	Nitrofurantoin	7 (2.5)	20 (7.2)	100 (36.1)	134 (48.4)	261 (94.2)
	Ampicillin & Flucloxacillin	18 (6.5)	45 (16.2)	102 (36.8)	96 (34.7)	261 (94.2)
	Ofloxacin	11 (4)	16 (5.8)	114 (41.2)	120 (43.3)	261 (94.2)
	Cefuroxime	23 (8.3)	52 (18.8)	101 (36.5)	85 (3.7)	261 (94.2)
	Sulphamethoxazole & trimethoprim	11 (4)	35 (12.6)	114 (41.2)	101 (36.5)	261 (94.2)
	Moxifloxacin	11 (4)	21 (7.6)	92 (33.2)	137 (49.5)	261 (94.2)

Table 8 showed that Amoxicillin was the highly dispensed antibiotic among the all mentioned ones. Where 27.1% and 48.7% of participants reported that they dispensed amoxicillin always and very often respectively.Table 8 also showed that 22% and 39% of participants always and very often dispensed Azithromycin without prescription respectively.

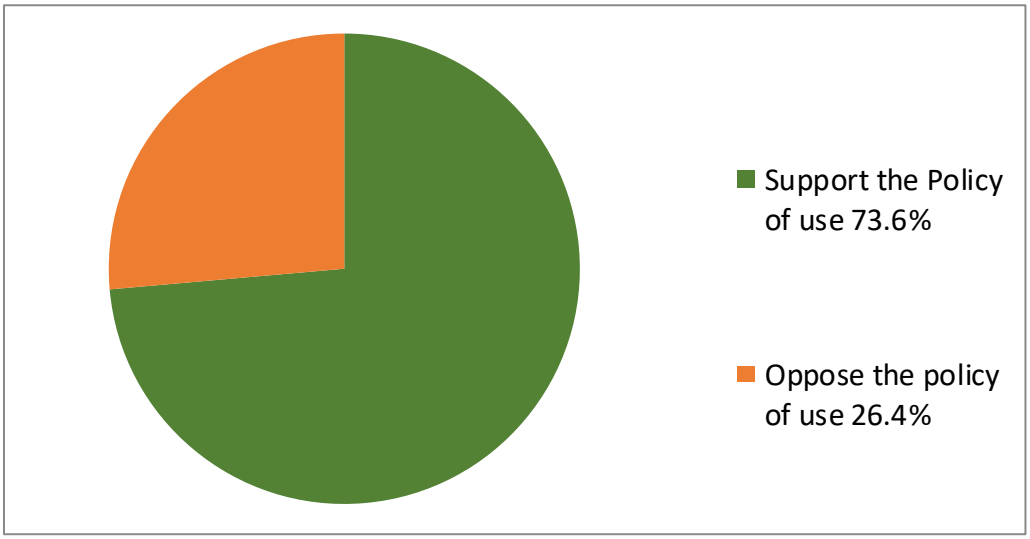
Table 10: Distribution of participants percentage according to their knowledge in legislation regards antibiotics policy of use.

variable	answers	No.	%
If the pharmacist know about the policy of not dispensing antibiotic without prescription in Palestine	know Don't know Total answers	251 26 277	90.6 9.4 100
If the pharmacists support this policy	Support Oppose Total answers	204 73 277	73.6 26.4 100

Table 9 showed that 90.6% of the participant pharmacists know that dispensing antibiotics without prescription is illegal and 9.4% don't know. Whereas, 73.6% support the policy of not dispensing without prescription and 26.4% oppose this policy.



Figuer 5: Participants knowledge regards policy of use.



Figuer 6: Participants opinion regards the policy of use.

5.2 Results of hypothesis

Table 11: Differences of dispensing antibiotics without prescription between the independent variables.

Independent variables		Dispensing antibiotics without prescription			Chi-square *P-value*
		Yes no. (%)	No no. (%)	Total no. (%)	
district	Jenin	39 (14.1)	0 (0)	39 (14.1)	6.188 0.721
	Nablus	55 (19.82)	3 (1.08)	58 (20.9)	
	Ramallah	41 (14.87)	3 (1.03)	44 (15.9)	
	Jerusalem	24 (8.62)	3 (1.08)	27 (9.7)	
	Hebron	43 (15.52)	3 (1.08)	46 (16.6)	
	Bethlehem	20 (7.18)	2 (0.72)	22 (7.9)	
	Tulkarm	19 (6.88)	2 (0.72)	21 (7.6)	
	Qalqalia	13 (4.7)	0 (0)	13 (4.7)	
	Jericho	3 (1.1)	0 (0)	3 (1.1)	
	Salfeet	4 (1.4)	0 (0)	4 (1.4)	
	total	261 (94.2)	16 (5.8)	277 (100)	
Owner of the pharmacy	Yes	80 (28.89)	5 (1.81)	85 (30.7)	0.003 0.960
	No	181 (65.33)	11 (3.97)	192 (69.3)	
	Total	261 (94.2)	16 (5.8)	277 (100)	
Practical experience	1-5 years	125 (45.1)	5 (1.8)	130 (46.9)	1.904 0.386
	6-10 years	53 (19.1)	5 (1.8)	58 (20.9)	
	More than 10 years	83 (29.94)	6 (2.16)	89 (32.1)	
	Total	261 (94.2)	16 (5.8)	277 (100)	
Work shifts	daytime	113 (40.79)	5 (1.81)	118 (42.6)	1.622 0.444
	Evening	58 (20.92)	3 (1.08)	61 (22)	
	Both shifts	90 (32.51)	8 (2.89)	98 (35.4)	
	Total	261 (94.2)	16 (5.8)	277 (100)	

The policy of using knowledge	Know	238 (85.9)	13 (4.7)	251 (90.6)	1.751 0.186
	Don’t know	23 (8.32)	3 (1.08)	26 (9.4)	
	Total	261 (94.2)	16 (5.8)	277 (100)	
Antibiotic resistance knowledge	Excellent knowledge	99 (35.73)	5 (1.81)	104 (37.54)	0.838 0.658
	Good knowledge	144 (51.97)	9 (3.26)	153 (55.23)	
	Poor knowledge	18 (6.5)	2 (0.73)	20 (7.23)	
	Total	261 (94.2)	16 (5.8)	277 (100)	

Table 10 showed that no statistical significant differences were found in dispensing antibiotics without prescription between pharmacists according to their; districts, being the owner of the pharmacy or not, practical experience in years, work shifts, knowledge regards policy of use, and antibiotic resistance knowledge.

Chapter Six

Discussion, Conclusion, recommendations, and limitations

6.1 Discussion

This study revealed that antibiotic sales without medical prescription in community pharmacists in the Palestinian West Bank are highly practiced. Whereas, the results showed that 94.2% of pharmacists are dispensing antibiotics without prescription, (table 2) and this, in turn, will lead to wrong antibiotic choice, undesirable side effects for the patient that could be avoided if there is no need for the antibiotic, and health resources wasting.

Multiple studies on the same subject showed alarming results and revealed that non-prescribed antibiotic selling is a common practice. The extent for antibiotic dispensing without medical prescription was 87.6 in Eritrea (Bahta *et al*., 2020),Damascus, Syria (89.3%) (Bahnassi, 2015), Riyadh, KSA (77.6%) (Bin Abdulhak*et al*., 2011), North of Spain (72.8%) (Zapata-Cachafeiro *et al*., 2014), Albania (80%) (Hoxha, Malaj, Tako, &Malaj, 2015).Other studies have shown less frequent dispensing of antibiotics without prescription in many countries, Catalonia, Spain (45.2%) (Lior, Monnet, Cots, 2010), Beirut and its suburbs, Lebanon (32%) (Farah *et al*., 2015), North-Western, Spain (18.83%), Sri Lanka (41%), Urban cities of China (66.8%).Results of studies conducted in Eastern Amman, Jordan (96.3%), (Abuirmeileh, Samara, Alkhodari, Bahnassi, Talhouni, Hayallah,

2014)Southwest Ethiopia (94.4%), and Moshi municipality, Tanzania (92.3%) were very close to the findings of the current study. (Bahta *et al*., 2020).The discrepancy in the findings of the above studies is because of the differences in low enforcement between countries, methodological approach, and sample size.

Nowadays, the relationship between the inappropriate use of antibiotics and bacterial resistance is clear. There are many forms for inappropriate use of antibiotics practices by community pharmacists in West Bank; about 83% of pharmacists sometimes or always dispensed antibiotics upon patient request, (table 2) and this is a real problem that reflects patient complacency because the patient himself made the diagnosis and give treatment.A previous study in Beirut suburbs, Lebanon showed that dispensing antibiotics upon patient request in lower and higher socioeconomic levels were 1.9% and 6.3% respectively.(Farah *et al*., 2015).A study conducted in Lithuania showed that about 22% of patients were self-medicated with antibiotics.(Berzanskyte, Valinteliene, Haaijer-Ruskamp, Gurevicius, Griogoryan, 2006).The findings of another study in Zimbabwean showed that 7.5% of pharmacists agree to dispense antibiotics without prescription upon patient request. (Nyazema, Viberg, Khoza, Vyas, Kumaranayake, Tomson, Stalsby, 2007).About 8% of pharmacists dispense antibiotics in form of injections without a prescription, (table 2) and it is known that injection's side effects are more severe especially in the presence of allergic reactions.A result of a previous study conducted in Abu-Dhabi, UAE showed less frequency of dispensing injection form of

antibiotics without prescription with only 1%. (Dameh, Green, Norris, 2010).

About 46% of pharmacists may repeat the same antibiotic for a patient (table 2) and this reuse will lead to an increased chance of bacterial resistance and increase the risk of potential side effects, in addition, to increasing the cost of treatment on the patient. A study conducted in Australia showed that 22.1% of the dispensed antibiotics were repeated prescriptions. (Fredericks, Hollingworth, Pudmenzky, Rossato, Kairuz, 2017). A previous study in Syria showed that 87.8% of pharmacists repeat the same antibiotic to the patient. (Bahnassi, 2015).

Taking one strip of antibiotics for a patient is a well-known practice among Palestinian people, and 70% of pharmacists may sell an incomplete course of antibiotics for a patient without a prescription. (table 2). Not completing the course of antibiotic treatment will easily lead to bacterial resistance to that antibiotic.The finding of a previous study conducted in two districts of central Nepal is similar to the finding of the current study, with 73% dispensed incomplete course of antibiotic.(Ansari, 2017).

It is a common mistake to take antibiotics for the flu. Antibiotics only treat infections due to bacteria and if taken carelessly for any type of infection like viral illnesses it may lead to more serious health problems, make the illness last longer, the antibiotic will attack the beneficial bacteria in the body, and the patient may complain many side effects. Antibiotics will not kill flu viruses, and 23.5% of pharmacists may give Amoxycillin without

prescription for a patient with symptoms of Flu-like runny nose and headache.(table 2). A study conducted in Upper Egypt has shown more frequent (99.1%) dispensing of Amoxycillin without prescription for patients requesting it for flu-like symptoms. (Abdelaziz, Tawfik, Rabie, Omran, Hussein, Abou-Ali, Ahmed, 2019).Where, the result of a study in eastern Amman, Jordan has shown less frequency (16.7%) for the same practice. (Abuirmeileh *et al*., 2014).

Pharmacists feel comfortable dispensing antibiotics for their relatives and friends, where 83.7% may dispense antibiotics without prescription for relatives and friends, (table 2), this high percent indicates that pharmacists have adequate experience and they believed that they can follow up the patient more easily if he is one of their family members or friends. The finding of a study conducted in Syria was too close to the finding of the current study with 89.8% of pharmacists dispensing antibiotics without prescription for relatives or friends. (Bahnassi, 2015).Where a study in Zimbabwean showed that only 21% of pharmacists would sell antibiotics for relatives or friends. (Nyazema *et al*., 2007)

Pharmacists in general avoid giving antibiotics to pregnant women, they have a sense of responsibility considering the risk to the fetus, and about 32% of them may dispense antibiotics for the pregnant woman without prescription (table 2). A study in Syria has shown more frequency to dispense antibiotics without prescription for pregnant women (65.3%). (Bahnassi, 2015).

Misusing of antibiotics extends to all age groups, about 14% of pharmacists may dispense antibiotics without prescription for infants less than 1 year, (table 2) 80% may dispense it for a child less than 12 years, (table 2) 90% may dispense it for adult less than 60 years, (table 2) and 75% of them may dispense it for elderly more than 60 years. (table 2).Older people are affected by side effects more than other ages which can cause problems in the whole body, it may cause drug interaction, allergy or rashes, nausea, diarrhea, kidney problems, nerve damage, and we should always remember that every time we take antibiotics, we increase the risk of developing resistant bacteria.The results of a previous study conducted in Beirut and its suburbs, Lebanon showed that dispensing antibiotics without prescription between lowand high socioeconomic areas were as follows: for infants13.5% and 4.2%, for children 69.2% and 27.1%, and elderly 48% and 21% respectively.(Farah *et al*., 2015).

Pharmacists have a major role in the war on antibiotic resistance. Especially the community pharmacists who have a significant opportunity to prevent inappropriate antibiotic use. Where the patients mainly go to their community pharmacists first to ask for medical advice to alleviate the symptoms they complain. And when the pharmacists were asked about the reason for which they dispensed antibiotics without prescription, more than half of the participants attributed it to the inability of the patient to visit a doctor. (table 3). The result of a study conducted in Eastern Amman, Jordan has shown less frequency with 40.7% of the interviewed pharmacists attributing it to avoid physician visits and the patient inability

to visit a doctor. (Abuirmeileh*et al*., 2014). And only 10% of pharmacists in a study conducted in Zimbabwean would dispense it if the patient cannot afford to visit a doctor. (Nyazema *et al*., 2007).Where a study conducted in Jeddah, KSA showed more frequency with 91.6% of pharmacists dispensing some types of antibiotics without prescription believed that most people can only afford pharmacy visits. (Al-Mohamadi *et al*., 2013).A study conducted in Makkah, KSA showed that the reasons for that practice were mainly because the patient doesn't want to consult a physician unless the infection is serious 69.9%, Patient inability to visit a doctor 65.3%, and pharmacists have good knowledge regards antibiotics use 45.8%. (Abdul Hadi *et al*., 2016).

Pharmacists make mistakes in prescribing antibiotics either for children or adults; they often prescribe antibiotics for many symptoms similar to those of bacterial infection. The sore throat was the most common symptom for which the pharmacists dispense antibiotics without prescription especially when it comes with fever.It is known that antibiotics will not help if a sore throat is caused by a virus, it is mainly self-treated. Sore throat with fever came as the foremost symptoms for which pharmacists dispense antibiotics without prescription with 72.6% and 80.1% for child and adult respectively, 61.1% and 74.7% for sore throat alone for child and adult. (table 6).The second symptom of the most common ones was burning sensation during urination or dysuria with 37.9% and 62.5% for children and adults respectively, (table 6) many illnesses and causes may lead to dysuria rather than bacterial infection like; dehydration, chemical irritants,

kidney stones, some medicines, urethritis…etc. So, antibiotics without urine culture may harm the body by its side effects. A previous study in Eastern Amman, Jordan showed that sore throat was the main symptom for dispensing antibiotics without prescription with 38.9%, and less frequent with only 3.7% for UTI symptoms. (Abuirmeileh*et al*., 2014).A study conducted in Eritrea showed that most non-prescribed antibiotics were given for uncomplicated UTI with 89.2% and watery diarrhea with 86.1%. (Bahta *et al*., 2020).In Beirut and its suburbs, Lebanon, Sore throat with fever 71% and 43% for adult and child respectively, burning during urination 61% for adult, and feverish diarrhea 65% and 28% for adult and child respectively. (Farah *et al*., 2015).In Catalonia, Spain 79.7% for UTI symptoms. (LIor &Cots, 2009; LIor, Monnet&Cots, 2010).In Riyadh, KSA with 90% for both sore throat and diarrhea, UTI with 75%. (Bin Abdulhak, 2011).In Makkah, KSA68.4% for colds and flu, 56.1% for rhinitis, and 52.4% for toothache.(Abdul Hadi *et al*., 2016).

It is well known that antibiotic choice is not easy. Clinician examinations by a physician and culture must be done to determine the appropriate one; antibiotics should be used when the doctor is sure that there is a bacterial infection. When the pharmacists choose a particular antibiotic to dispense it without prescription, more than 80% of the participants depend on the antibiotic efficiency in treating the mentioned symptoms by the patients. (table 3). A study conducted in Beirut and its suburb, Lebanon showed that more than 70% of the pharmacists involved based on the antibiotic

efficiency and tolerability when choosing a particular one. (Farah *et al*., 2015).

It should be noted that 36% of the participants think that there is no danger or any potential effects in giving some types of antibiotics. (table 3).Like all drugs, antibiotics have side effects and they can make harm to the body if taken unnecessarily. Despite that, there are specific side effects for some types of antibiotics, but there are common effects like diarrhea and allergy that may be deadly. Less frequent in a previous study conducted in Beirut and its suburbs, Lebanon presented that 19.25% of participated pharmacists think that there is no risk with some antibiotics. (Farah *et al*., 2015).

When pharmacists were asked about the most dispensed antibiotic without prescription in their pharmacies, 63.2% of them answered with Amoxicillin, 21.7% for Amoxicillin and clavulanic acid, and 15.2% for Azithromycin. (table 7).Amoxicillin was the highly dispensed antibiotic as 75.8% of the participants reported that they always or very often prescribe it, where 61% of them always or very often prescribed Azithromycin. (table 8).A study conducted in eastern Amman, Jordan showed that 83.5% of antibiotics dispensed by pharmacists without prescription for pediatric patients were Amoxicillin or Amoxycillin and clavulanic acid and the second one was Azithromycin with 10.9%. For an adult, 83.7% for Amoxicillin or Amoxycillin and clavulanic acid, Cefuroxime 7.4%, and Azithromycin 5.6%. (Abuirmeileh*et al*., 2014).A study in Brazil showed that the most frequent antibiotic obtained without medical prescription was

Amoxicillin with 74.3%, Azithromycin with 9.6%.(Volpato,Souza, Rosa, Melo, Daudt, Deboni, 2005). In Makkah, KSA, Penicillins 72.5%, Cephalosporins 63.5%, and Macrolides 40.7%. (Abdul Hadi *et al*., 2016).A qualitative study in Addis Ababa, Ethiopia showed that the most commonly prescribed antibiotics without prescription were Amoxicillin followed by Ciprofloxacin and Cotrimoxazole. (Gebretekle &Serbessa, 2016).

There is a clear difference in pharmacists' dispensing practices regards different types of antibiotics. Most of the participants dispensed Amoxycillin and Azithromycin without prescription very frequently. On the other hand, about half of them never dispensed Moxifloxacin without prescription. (table 8).And when pharmacists were asked about the reason for not dispensing some types of antibiotics without prescription, their answers were:

- It’s a strong effective antibiotic that needs a prescription from a specialized doctor.
- Fear of its side effects and some pharmacists don’t have good knowledge about specific side effects for some antibiotics.
- The patient needs to make medical tests and culture before taking some antibiotics.
- The patient needs to be examined by a doctor for some types of infections.

- These antibiotics are a new generation and the pharmacist doesn’tknow about their effectiveness and its drug interaction.
- The high price of these antibiotics on the patient.
- Fear of allergy from these antibiotics.
- The pharmacist doesn’t know the type of bacteria covered by these antibiotics.
- To reduce the abuse of antibiotics using and to reduce the resistance to these antibiotics. The pharmacists mainly prefer to dispense the older generations of antibiotics based on the type of infection.

It seems that pharmacists in dispensing antibiotics without a prescription care about the patient, and do not pay attention for profitable and financial reasons. Small percentage care about the expiry date or the bonus and sales from the manufacturing company of the dispensed antibiotic, and only 20% give importance to keeping customers.(table 3).But there is no excuse to dispense antibiotics without prescription.Pharmacists of different ages, years of experience, and districts, and whether they were males or females, all have high confidence that they have the right to dispense antibiotics without prescription, and have the knowledge to choose a particular one.The results proved that there were no statistically significant differencesbetween dispensing antibiotics without prescription and the districts (pharmacy location), owner of the pharmacy or not, work shifts, and years of experience,(tables 10).These results were not much different

from the one conducted in north Spain, that reported being the owner of the pharmacy or not, and the years of experience were not significantly associated with dispensing antibiotics without prescription. (Zapata-Cachafeiro*et al*., 2014). Another study in Eritrea showed that the work years of experience were not significant, but the regional location of the pharmacy significantly influenced dispensing antibiotics without prescription, as pharmacists in the central region of Eritrea in the capital city which includes higher facilities were dispensing antibiotics without prescription more than other regions. (Bahta *et al*., 2020).In the current study in West Bank, Palestine the location was not significant because there are not many differences in the commercial or residential areas between districts.

When pharmacists were asked about their opinion on the policy that prevents dispensing antibiotics without prescription in Palestine, more than a quarter of them oppose this policy. (table 9).From here, it emerges that there is a problem related to the degree of awareness among pharmacists and a problem in law enforcement that make this pharmacist apathetic. Despite all of that, more than 99% of the participant pharmacists are mainly committed to giving enough information about the dispensed antibiotic with or without prescription, regards the dose, common side effects, how to take the antibiotic, and the importance of completing the prescribed antibiotic. (table 2). Results of a study conducted in Makkah, KSA were close to the result of the current study, where 94.7% of the participated pharmacists always or sometimes educated the patient about the importance

of completing the course of antibiotics and 89.5% always or sometimes warned the patient about potential side effects of the dispensed antibiotic.(Abdul Hadi *et al*., 2016).

More than 90% of the participants are considered with excellent and good knowledge regarding antibiotic resistance problem (table 10) and 90.6% know about the policy of not dispensing antibiotics without prescription in Palestine. (table 9) This high percentage of good knowing besides still dispensing antibiotics without prescription indicates carelessness and irresponsibility among pharmacists, and there are no rules and regulations enforced correctly regards decision-makers. A previous study in Suadi Arabia reported that 70.5% of participating pharmacists knew that dispensing antibiotics without prescription is an illegal practice, the same study in Saudi Arabia had shown that 88.4% of the participants knew that antibiotic resistance has become a public health issue and 85.2% of them knew that dispensing antibiotics without prescription is contributing to the development of antimicrobial resistance. (Abdul Hadi *et al*., 2016).Another study in upper Egypt showed that 96% of the interviewed pharmacists agreed or strongly agreed that antibiotic resistance is a major public health problem. (Abdelaziz *et al*., 2019).

Antibiotics are powerful drugs against bacterial infections; they should be used appropriately only when needed. A real prominent intervention is required. If we do not pay attention and work on this problem now, it will be a disaster later.

6.2 Limitations of the study

1. I faced some difficulties during the time of data collection. Pharmacists did not cooperate well. Where some pharmacists refused to participate, some did not fill the questionnaire after I came back to collect it.

2. The expectation of behavior change of the participant's pharmacists incase of the presence of the researcher, because the study discusses an illegal common practice regarding the misuse of antibiotics, fear of specifying the address of the pharmacy, and some fear if this questionnaire will be sent to the Ministry of health. So, the findings may underestimate the antibiotics dispensation without prescription behavior.

3. Lack of similar national studies to compare with it.

4. The pharmacists answers might be biased to what they are expected to answer rather than what is actual.

6.3 Conclusion

Sales of non-prescribed antibiotics in community pharmacies in Palestine are alarming, which can worsen and exacerbate the antibiotic resistance problem.

6.4 Recommendations

More regulations, multiple strategies, and follow up are needed by policymakers to avoid inappropriate antibiotic misuse and overuse:

- Increase pharmacist's awareness by pharmacists continuous education program about the rational use of antibiotics, the risk of the antibiotic resistance problem, and the importance of advising the patient about the correct use of the prescribed antibiotic.
- Strengthening of the existing Law that prevents prescribe antibiotics without prescription
- More studies are needed to find the reason behind this overuse of non-prescribed antibiotics.
- Law enforcement on pharmacists besides forcing the physicians to write the prescriptions with the scientific name of the antibiotic will significantly reduce the miss and overuse of antibiotics.

References

- Abdelaziz, A., Tawfik, A., Rabie, K., Omran, M., Hussein, M., Abou-Ali, A., Ahmed, Al-Sh. (2019). Quality of Community Pharmacy Practice inAntibiotic Self-Medication Encounters: A SimulatedPatient Study in Upper Egypt. *MDPI*, 8(35).

- Abdul Hadi, M., Karami, N., Al-Muwalid, A., Al-Otabi, A., Al-Subahi, E., Bamomen, A., Mohameda, ., Elrggal, M. (2016). Community pharmacists' knowledge, attitude, and practices towards dispensing antibiotics without prescription (DAwP): a cross-sectional survey in Makkah Province, Saudi Arabia. *International Journal Of Infectious Diseases*, 47, 95-100.

- Abuirmeileh, A., Samara, S., Alkhodari, A., Bahnassi, A., Talhouni, A., Hayallah, A. (2014). Antibiotic dispensing without prescription in Jordanian community pharmacies: A pharmacists perspective. *Bulletin Of Pharmaceutical Sciences*, 37(1), 51-63.

- Al-Mohamadi, A., Badr, A., Bin Mahfouz, L., Samargandi, D., Al Ahdal, A. (2013). Dispensing medications without prescription at Saudi community pharmacy: Extent and perception. *Saudi Pharm J*, 21(1), 13–18.

- Ambwani, S., Mathur, A. (2006). Rational drug use. *Health Administrator*, XlX, 5-7.

- Aminov R. I. (2010). A brief history of the antibiotic era: lessons learned and challenges for the future. *Frontiers In Microbiology, 1*, 134.

- Ansari, M. (2017). Evaluation of community pharmacies regarding dispensing practices of antibiotics in two districts of central Nepal. *Plos One,* 12(9).

- Auta, A., Abdul Hadi, M., Oga, E., Adewuyi, EO., Abdu-Aguye, S., Adeloye, D., Strickland-Hodge, B., Morgan, DJ. (2019). Global access to antibiotics without prescription in community pharmacies: A systematic review and meta-analysis. *Journal Of Infection*, 78(1), 8-18.

- Bahnassi, A. (2015). A qualitative analysis of pharmacists' attitudes and practices regarding the sale of antibiotics without prescription in Syria. *Journal Of Taibah University Medical Sciences*, 10(2), 227-233.

- Bahta, M., Tesfamariam, S., Weldemariam, D., Yamane, H., Tesfamariam, E., Alem, T., Russom, M. (2020). Dispensing of antibiotics without prescription and associated factors in drug retail outlets of Eirteria: A simulated client method. *PLOS ONE*, 15(1).

- Barriere, L. S. (2015) Clinical, economic, and societal impact of antibiotic resistance. *Expert Opinion On Pharmacotherapy*, 16(2),151-153.

- Berzanskyte, A., Valinteliene, R., Haaijer-Ruskamp, F., Gurevicius, R., Griogoryan, L. (2006). Self-Medication with antibiotics in Lithuania.

International Journal Of Occupational Medicine And Environmental Health, 19(4), 246-53.

- Bin Abdulhak, A. A., Altannir, M. A., Almansor, M. A., Almohaya, M. S., Onazi, A. S., Marei, M. A., Tleyjeh, I. M. (2011). Non prescribed sale of antibiotics in Riyadh, Saudi Arabia: a cross-sectional study. *BMC Public Health*, *11*, 538.

- Bitar, J., Masri, H., Hamad, M., Nasharti, R., Karaman, S., Laham, F., Laham, H. (2017). Health Annual Report Palestine 2017. Nablus-Palestine: Palestinian Health Information Center.

- Cals, J., Boumans, D., Lardinois, R., Gonzales, R., Hopstaken, R., Butler, C., Dinant, G. (2007). Public beliefs on antibiotics and respiratory tract infections: an internet-based questionnaire study. *British Journal Of General Practice*, 57(545), 942-947.

- Cheaito, L., Azizi, S., Saleh, N., Salameh, P. (2014). Assessment of self-medication in population buying antibiotics in pharmacies: A pilot study from Beirut and its suburbs. *Int J Public Health*, 59(2), 319-2.

- Chokshi, A., Sifri, Z., Cennimo, D., Horng, H. (2019). Global Contributors to Antibiotic Resistance. *J Glob Infect Dis*, 11(1), 36-42.

- Dameh, M., Green, J., Norris, P. (2010). Over-the-counter sales of antibiotics from community pharmacies in Abu Dhabi. *Pharmacy World & Science*, 32, 643-650.

- Dameh, M., Norris, P., Green, J. (2012). New Zealand pharmacists' experiences, practices and views regarding antibiotic use without prescription. *J PRIM Health Care*. 4(2), 131-140.

- Eklund, L., Martensson, U. (2012). Using geographical information systems to analyse accessibility to health services in the West Bank, Occupied Palestinian Territory. *Eastern MediterraneanHealth Journal*, 18(8), 796-802.

- Farah, R., Lahoud, N., Salameh, P., Saleh, N. (2015). Antibiotic dispensation by Lebanese pharmacists: A comparison of higher and lower socio-economic levels. *JIPH*, 8(1), 37-46.

- Fredericks, I., Hollingworth, S., Pudmenzky, A., Rossato, L., Kairuz, T. (2017). Repeat' prescriptions and antibiotic resistance: findings from Australian community pharmacy. *International Journal Of Pharmacy Practice*, 25(1), 50–58.

- Friedman, N. D., Temkin, E., &Carmeli, Y. (2016) The negative impact of antibiotic resistance. *Clin Microbiol Infect*, 22, 416-422.

- Gebretekle, G., Serbessa, M. (2016). Exploration of over the counter sales of antibiotics in community pharmacies of Addis Ababa, Ethiopia: pharmacy professionals' perspective. *Antimicrobial Resistance And Infection Control*, 5(2).

- Giacaman, R., Abdul-Rahim, H. F., & Wick, L. (2003). Health sector reform in the Occupied Palestinian Territories (OPT): targeting the forest or the trees?. *Health Policy And Planning*, 18(1), 59–67.

- Hoxha, I., Malaj, A., Tako, R., Malaj, L. (2015). Survey on how antibiotics are dispensed in community pharmacies in Albania. *International Journal Of Pharmacy and Pharmaceutical Sciences*, 7(7), 449-450.

- Kapoor, G., Saigal, S., &Elongavan, A. (2017). Action and resistance mechanisms of antibiotics: A guide for clinicians. *Journal of anaesthesiology, Clinical pharmacology*, *33*(3), 300–305.

- Khdour, M., Kurdi, M., Hallak, H., Jarab, A., Dweib, M., Al-Shahed, Q. (2016). Pharmacists' Knowledge, Attitudes and Practices Towards Herbal Remedies In West Bank, Palestine. *International Archives Of Medicine: Global Health & Health Policy*, 9, 1-7.

- Klein, E., Milkowska-Shibata, M., Tseng, K., Sharland, M., Gandra, S., Pulcini, C., Laxminarayan, R. (2020). Assessment of WHO antibiotic consumption and access targets in 76 countries, 2000–15: an analysis of pharmaceutical sales data. *The LANCET Infectious Diseases*, 21(1), 107-115.

- Leal, H. F., Azevedo, J., Silva, G., Amorim, A., de Roma, L., Arraes, A., Reis, J. N. (2019). Bloodstream infections caused by multidrug-

resistant gram-negative bacteria: epidemiological, clinical and microbiological features. *BMC Infectious Diseases*, *19*(1), 609.

- Llor, C., & Bjerrum, L. (2014). Antimicrobial resistance: risk associated with antibiotic overuse and initiatives to reduce the problem. *Therapeutic Advances In Drug Safety*, 229-241.

- LIor, C., Cots, J. (2009). The sale of antibiotics without prescription in pharmacies in Catalonia, Spain. *Clinical Infectious Diseases*, 48(10), 1345-1349.

- Lior, C., Monnet, D., Cots, J. (2010). Small pharmacies are more likely to dispense antibiotics without a medical prescription than large pharmacies in Catalonia, Spain.*Euro Surveill,* 15(32).

- Mashowska, A., Lundborg, C. (2019). Drivers for irrational use of antibiotics in Europe. *Int. J. Environ. Res. Public Health,* 16(1).

- Nair, M., Tripathi, S., Mazumdar, S., Mahajan, R., Harshana, A., Pereira, A., Jimenez, C., Halder, D., Burza, S. (2019). "Without antibiotics, I cannot treat": A qualitative study of antibiotic use in Paschim Bardhaman district of West Bengal, India. *Plos One*, 14(6).

- Nathwani, D., Dryden, M., Seaton, A. (2018). *Antimicrobial Stewardship From Principles To Practice*. BSAC, 53 Regents place, Birmingham, B1 3NJ, United Kingdom.

- Nyazema, N., Viberg, N., Khoza, S., Vyas, S., Kumaranayake, L., Tomson, G., Stalsby, C. (2007). Low sale of antibiotics without prescription: a cross-sectional study in Zimbabwean private pharmacies. *Journal Of Antimicrobial Chemotherapy*, 59(4), 718-726.

- Power, E. (2006). Impact of antibiotic restrictions: the pharmaceutical perspective. *CMI*, 12(5), 25-34.

- Rangan, P., Kumari, A., Chakrawarty, A. (2015). How can doctors improve their communication skills?.*Journal Of Clinical And Diagnostic Research*, *9*(3).

- Smith, I., Paulin, S. (2019). Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries. A practical toolkit. Geneva: World Health Organization; 2019. License: CC BY-NC-SA 3.0 IGO.

- Stuart, L. (2000). Antibiotic and antiseptic resistance: impact on public health. *The Pediatric Infectious Disease Journal*, 19(10), 120-122.

- Ventola C. L. (2015). The antibiotic resistance crisis: part 1: causes and threats. *P &T : A Peer-Reviewed Journal For Formulary Management*, *40*(4), 277–283.

- Volpato, D., Souza, B., Rosa, L., Melo, L., Daudt, C., Deboni, L. (2005). Use of antibiotics without medical prescription. *Brazillian Journal Of Infectious Diseases*, 9(4).

- World Health Organization. (2015). Global action plan on antimicrobial resistance. World Health Organization. https:// apps. who. int/ iris/ handle/10665/193736.

- World Health Organization. (2019). WHO releases the 2019 AWaRe Classification Antibiotics. World Health Organization. https://www.who.int/medicines/news/2019/WHO_releases2019AWaRe_classification_antibiotics/en/

- Zapata-Cachafeiro, M., González-González, C., Váquez-Lago, JM., Lopez-Vazquez, P., Lopez-Duran, A., Smyth, E., Figueiras, A. (2014). Determinants of antibiotic dispensing without a medical prescription: a cross-sectional study in the north of Spain. *J AntimicrobChemother*. 69(11), 3156–3160.

Annexses

Annex (1)

استبيان البحث

زملائي الصيادلة والصيدلانيات المحترمين/ات

تحية طيبة،

انا الطالبة "هبة علي حواري" في قسم ماجستير ادارة الصحة العامة في جامعة النجاح الوطنية، اقوم باعداد دراسة تحت عنوان (صرف الصيادلة للمضادات الحيوية بدون وصفة طبية: دراسة مقطعية في الضفة الغربية ,فلسطين) ولهذه الدراسة تم اعداد هذا الاستبيان بالاسئلة التالية وارجو التكرم بالاجابة عليها بشكل دقيق وصحيح وسأكون شاكرة لكم.

هذا الاستبيان سيتم استخدامه لاغراض البحث العلمي فقط واعدكم بالسرية التامة.

القسم الاول معطيات ديمغرافية واجتماعية:

العمر :_____

الجنس: ذكر / انثى

سنة التخرج:_____

عدد سنوات الخبرة العملية:_____

هل انت مالك الصيدلية؟ نعم / لا

الدوام : صباحي / مسائي / صباحي ومسائي

_____عنوان الصيدلية:

القسم الثاني معطيات تتعلق بالممارسات اليومية في صرف المضادات الحيوية:

1. هل تقوم احيانا بصرف مضاد حيوي بدون وصفة؟ نعم / لا

   (في حال كانت اجابتك نعم، انتقل للسؤال التالي وفي حال كانت اجابتك لا، يمكنك فقط الاجابة عن الاسئلة الموضوع تحتها خط)

2. ماهو عدد المضادات الحيوية التي يتم صرفها يوميا بوصفة طبية وبدون وصفة:
   - اقل من 10يوميا
   - 10-30 يوميا
   - اكثر من 30 يوميا

3. هل تقوم بصرف مضادات حيوية بدون وصفة بناءا على طلب المريض:
   - دائما
   - احيانا
   - ابدا
4. في حال تم اعطاء مضاد حيوي بدون وصفة بناءا على طلب المريض, هل يتم سؤال المريض عن سبب طلبه للمضاد الحيوي: نعم / لا
5. هل تقوم بنفسك بناءا على رأيك بصرف مضاد الحيوي بدون وصفة:
   - دائما
   - احيانا
   - ابدا
6. اقوم بصرف مضاد حيوي على شكل حقن بدون وصفة: نعم / لا / احيانا
7. اقوم باعطاء مضادين حيويين في نفس الوقت للمريض بدون وصفة: نعم / لا / احيانا
8. اقوم بصرف مضاد حيوي بدون وصفة للاطفال الرضع دون عمر سنة: نعم / لا / احيانا
9. اقوم بصرف مضاد حيوي بدون وصفة للاطفال من عمر سنة الى 12 سنة: نعم / لا / احيانا
10. اقوم بصرف مضاد حيوي بدون وصفة للبالغين حتى عمر 60 سنة بدون وصفة: نعم / لا / احيانا
11. اقوم بصرف مضاد حيوي بدون وصفة لكبار السن فوق 60 سنة: نعم / لا / احيانا
12. اقوم بصرف مضاد حيوي بدون وصفة للمعارف والاقارب: نعم / لا / احيانا
13. اقوم بصرف مضاد حيوي بدون وصفة لامرأة حامل تشكو من اعراض التهاب مجرى البول: نعم / لا / احيانا
14. اقوم باعادة صرف مضاد حيوي لمريض قام سابقا باخذ نفس المضاد لمجرد طلبه بذلك: نعم / لا / احيانا
15. مريض يعاني من اعراض سيلان انف وصداع, طلب منك صرف مضاد حيوي Amoxycillin هل تقوم باعطاءه؟: نعم / لا / احيانا

16. اقوم باعطاء المريض شريط واحد من المضاد الحيوي في حال طلب ذلك: نعم / لا / احيانا

17. هل تقوم باعطاء المعلومات للمريض عند صرف المضاد الحيوي سواء بوصفة طبية او بدون من ناحية طريقة الاستخدام والجرعة وطريقة تناول المضاد الحيوي والاعراض الجانبية ومدى اهمية تناول العلاج كاملا:

- دائما
- معظم الاحيان
- احيانا
- نادرا
- لا اعطي اي معلومات واكتفي بكتابة عدد الحبات في اليوم على العلبة

18. في حال كانت اجابتك للسؤال السابق هي " لا اعطي اي معلومات واكتفي بكتابة عدد الحبات في اليوم على العلبة" ماهي الاسباب: (يمكن اختيار اكثر من اجابة) او انتقل للسؤال التالي في حال عدم قيامك بهذا الاختيار

- لا يوجد وقت كافي
- لا اجدها معلومات مهمة
- اعتقادك بان المريض لن يكترث بهذه المعلومات
- توقعك بخوض في جدال مع المريض
- توقعك بتردد المريض باخذ العلاج وارجاعه

القسم الثالث محددات صرف المضاد الحيوي بدون وصفة:

19. ماهي الاسس التي تعتمدها في اختيار المضاد الحيوي عند صرفه بدون وصفة: (يمكن اختيار اكثر من اجابة لهذا السؤال)

- حسب الشركة المصنعة
- حسب فعالية المضاد الحيوي في علاج الاعراض المذكورة
- حسب العروض (البونص والنسبة) المقدمة من شركات تصنيع وبيع الادوية
- حسب تاريخ انتهاء صلاحية المضادات المتوفرة بالصيدلية

20. اسباب صرف المضاد الحيوي بدون وصفة: (يمكن اختيار اكثر من اجابة لهذا السؤال)

- المريض لايستطيع مراجعة الطبيب
- لاسباب مادية ربحية
- الحفاظ على الزبائن
- لايوجد خطر او مشكلة في اعطاء بعض انواع المضادات الحيوية

القسم الرابع المعلومات المتعلقة بالمضاد الحيوي:

21. فيما يتعلق بمشكلة مقاومة البكتيريا المضاد الحيوي (antibiotic resistance) هل انت على علم بهذه المشكلة؟ نعم/لا

22. مقاومة البكتيريا للمضاد الحيوي هي مشكلة خطيرة قد تؤدي للوفاة احيانا: نعم/ لا

23. مقاومة البكتيريا للمضاد الحيوي غالبا ماتحدث عند كبار السن اكثر من الاعمار الصغيرة والمتوسطة؟ نعم/ لا

القسم الخامس الاعراض الشائعة لصرف المضاد الحيوي بدون وصفة:

24. يرجى تعبئة الجدول التالي "نعم" في حال يتم صرف مضاد حيوي بدون وصفة للاعراض المذكورة و"لا" في حال عدم الصرف او التحويل لطبيب مختص:

الاعراض التي يشكو منها المريض	الاطفال		البالغين	
	نعم	لا	نعم	لا
اسهال				
اسهال مع حرارة				
اسهال مع وجود دم				
حرقة اثناء التبول				
حرقة اثناء التبول مع حرارة				
التهاب الحلق				
التهاب الحلق مع قحة				
التهاب الحلق مع حرارة				
قحة مع حرارة				
قحة مع بلغم				
قحة مع حرارة والام بالصدر وضيق بالتنفس				

القسم السادس المضادات الحيوية الشائع صرفها بدون وصفة:

25. ماهو اكثر مضاد حيوي يتم صرفه بدون وصفة بالصيدلية_____

26. هل تقوم بصرف المضادات الحيوية التالية بدون وصفة:

	دائما	معظم الحالات	حالات محدودة	لا اقوم بصرفه بدون وصفة
Amoxycillin				
Cephalexin				
Cefdinir				
Azithromycin				
Cefadroxil				
Cefixim				
Ciprofloxacin				
Doxycycline				
Clindamycin				
Erythromycin				
Clarithromycin				
Nitrofurantoin				
Ampicillin & Flucloxacillin				
Ofloxacin				
Cefuroxime				
Sulphamethoxazole & trimethoprim				
Moxifloxacin				

27. في الجدول السابق ماسبب اجابتك بلا اقوم بصرفة بدون وصفة لبعض المضادات الحيوية؟
(في حال لم تقم بهذا الاختيار انتقل للسؤال التالي)

_____

_____

القسم السابع القوانين والتشريعات:

28. فيما يتعلق بسياسة منع صرف المضاد الحيوي بدون وصفة في فلسطين:

- هل انت على علم بهذه السياسة:_____
- هل انت مع ام ضد هذه السياسة:_____

يمكنك اضافة اي ملاحظة او تعليق او رأي شخصي:

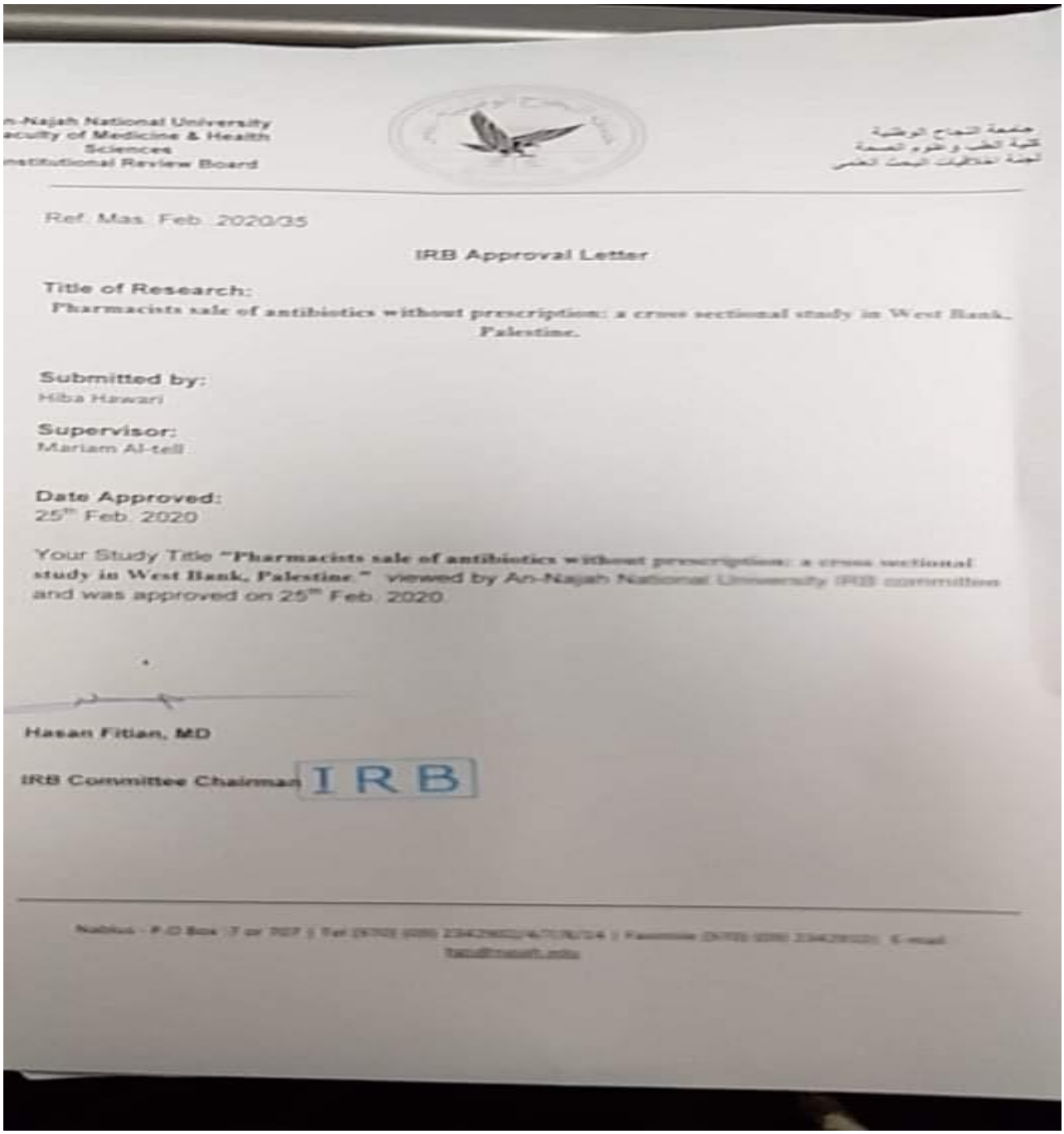
_____

_____

_____

Annex (2)

IRB Form



An-Najah National University
Faculty of Medicine & Health Sciences
Institutional Review Board

جامعة النجاح الوطنية
كلية الطب والعلوم الصحية
لجنة أخلاقيات البحث العلمي

Ref: Mas. Feb. 2020/35

IRB Approval Letter

Title of Research:
Pharmacists sale of antibiotics without prescription: a cross sectional study in West Bank, Palestine.

Submitted by:
Hiba Hawari

Supervisor:
Mariam Al-tell

Date Approved:
25th Feb. 2020

Your Study Title "**Pharmacists sale of antibiotics without prescription: a cross sectional study in West Bank, Palestine.**" viewed by An-Najah National University IRB committee and was approved on 25th Feb. 2020.

Hasan Fitian, MD

IRB Committee Chairman

IRB

جامعة النجاح الوطنية

كلية الدراسات العليا

صرف الصيادلة للمضادات الحيوية بدون وصفة طبية: دراسة مقطعية في الضفة الغربية

إعداد

هبه حواري

إشراف

د. مريم الطل

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الماجستير في برنامج ادارة الصحة العامة، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس- فلسطين.

2021

صرف الصيادلة للمضادات الحيوية بدون وصفة طبية: دراسة مقطعية في الضفة الغربية

إعداد

هبه حواري

إشراف

د. مريم الطل

الملخص

عدم الترشيد في استخدام المضادات الحيوية خصوصاً صرف المضادات الحيوية بدون وصفة قد فاقم مشكلة مقاومة البكتيريا للمضاد الحيوي. حيث يعتبر صيادلة المجتمع المصدر الأساسي لهذه الممارسة. وهناك حاجة ملحة لتغيير الطريقة التي نستخدم فيها المضادات الحيوية خاصة في ظل غياب قانون مفعل بشكل جيد وأنظمة صارمة. دراسة وصفية مقطعية تهدف إلى تقييم مساهمة الصيادلة في مشكلة مقاومة البكتيريا للمضاد الحيوي ومدى تقيدهم بالقوانين والأنظمة المتعلقة بعدم صرف مضاد حيوي بدون وصفة. تم اجراء جمع البيانات في الفترة مابين نيسان وحزيران للعام 2021. الاستبيان تم التحقق من صلاحيته ودقته واختباره بشكل تجريبي، وقد قام صيادلة المجتمع بتعبئته بأنفسهم.

عينة ملائمة تم اختيارها عشوائيا من صيادلة المجتمع، موزعين على العشرة محافظات في الضفة الغربية (n=277). عدد الصيادلة لكل محافظة تم تحديده باستخدام العينة الطبقية النسبية. تم ادخال وتحليل البيانات باستخدام (SPSS version 19). مدى صرف صيادلة المجتمع للمضادات الحيوية بدون وصفة وُجِد بنسبة 94.2٪. عدم قدرة المريض على زيارة الطبيب (58.1٪) كان اكثر سبب شائع لصرف المضادات الحيوية بدون وصفة. أكثر مضاد حيوي يتم صرفه بدون وصفة في اغلب الأحيان هو الاموكسيسيلين (63.2٪)، وأكثر عَرَض يقوم الصيادلة بصرف مضاد حيوي له بدون وصفة هو إلتهاب الحلق مع وجود حرارة بنسبة 72.6٪ و80.1٪ للأطفال والبالغين على التوالي. 90.6٪ من الصيادلة المشاركين على معرفة بسياسة منع صرف المضاد الحيوي بدون وصفة. بالإضافة إلى أنّه لم يتم إيجاد أي ارتباط ذو دلالة إحصائية بين صرف المضادات الحيوية بدون وصفة وكل المتغيرات المستقلة. كشفت هذه الدراسة أن صرف صيادلة المجتمع

للمضادات الحيوية بدون وصفة في الضفة الغربية الفلسطينية يتم ممارسته بشكل عالي ومبالغ فيه. المزيد من الأنظمة، استراتيجيات متعددة، ومتابعة مستمرة مطلوبين من قِبَل صانعين القرار لتجنب الاستخدام الغير ملائم للمضاد الحيوي.