

Antibiotic self-medication in Afghanistan: first report

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Abstract

Introduction: The purpose of this study was to find, the prevalence of self-medication with antibiotics, and antibiotics used for self-treated disease.

Methods: this cross-sectional study was carried out among 385 participants in 12 community pharmacies located in 4 different regions of Kabul from May to November 2017. Standard questionnaire based on similar studies was designed and distributed among participants. Data was collected and analyzed in SPSS 16.0.

Results: out of 385 participants (61.29% male and 38.70% female) 282 persons (73.25%) had practiced antibiotic self-medication during last year. The common reasons for antibiotic self-medication was economic problems (26.95%), lack of time (22.69%), comfortability (21.63%), lack of confidence on health care system (17.37%), and poor access to health care facilities (11.34%). Conditions like cough (28.01%), common cold (14.89%), respiratory infections (13.47%), sore throat (12.41%) and diarrhea (7.44%) were commonly self-medicated with antibiotics. penicillins (25.17%), metronidazole (15.60%), ceftriaxone (14.18%), tetracycline (10.28%), Azithromycin (9.21%), cefixime (7.09%), ciprofloxacin (6.73%) were mostly used for self-medication. 93 (32.97%) respondents had experienced side effects during antibiotic self-medication.

Conclusions: The prevalence of antibiotic self-medication is very high (75.53%) in Kabul and this widespread antibiotic use has increased the risk of antibiotic resistance. Awareness and Strict rules for selling antibiotics without prescription should be developed and implemented to improve the rational use of antibiotics. Only pharmacists or professional peoples should be permitted to work in pharmacies. The quality, accessibility and cost of health care services should be enhanced in order to improve patient' satisfaction in health care system.

Introduction

Antibiotics are generally used for the treatment of infectious disease (1, 2). inappropriate and unreasonable use of antibiotics increases the risk of drug interactions, hiding symptoms of the disease and development of microbial resistance (3). Antibiotic resistance is an increasingly public health problem that causes unsuccessful infection treatment, increased hospitalization time and health care expenditure, and ultimately amplifies social and economic problems (4, 5). Self-medication is a common cause of antibiotic resistance, a major public health problem, which is defined as using drugs for self-diagnosed disease without a suggestion from a physician, using or recommending drugs prescribed for others, using leftover drugs, refilling prescription or changing the dosage of drugs without asking a doctor, using herbal drugs and home medications (6, 7). According to WHO, if self-medication is used rationally and suitably, it can be cost-effective in treating and prevention of disease (8), but it is mostly used

irrationally and inappropriately with incorrect dosage, inadequate course of treatment, which can result in increased adverse effects, and drug resistance (9).

The prevalence of self-medication with antibiotic has been reported very common across the globe and is not confined to low/ middle-income countries (10). Studies in Islamabad city of Pakistan shows that self-medication with antibiotics has not changed from 2013 (77%) till 2016 (76%) (11). and 55.3% of medical students in Karachi city of Pakistan, had prescribed drugs autonomously and without the help of doctors while 48.5% of them did this practice 2–3 times in a year (12). 43% of medical students and 46% of non-medical students in Ben Ghazi city of Libya (13), 98% of medical and non-medical students in a Palestinian university (14), 79.5 % of university student in Sudan (15), and 53.2% of respondents in Letwania (16) had reported the practice of self-medication with antibiotics or antimalarial drugs. High prevalence of self-medication with antibiotics and high rate of antibiotic resistance has been reported in western and southern European countries (17) where the prevalence of antibiotic self-medication has reported 41%, most commonly for common cold (45%) and sore throat (17%) (18).

Antibiotic self-medication can cause social, economic and health problems because of emergence of microbial resistance, adverse drugs reactions, and increased time and cost of treatment (19). WHO has reported that antibiotic resistance is increasingly growing, which can be a threat to control of bacterial infections (20). In Afghanistan, limited data is available regarding antibiotic use. in a previous study regarding evaluation of antibiotic prescribing in Kabul, we found that, in 66% of prescriptions antibiotics were prescribed (average 1.508 antibiotics per prescription), while ceftriaxone, metronidazole and amoxicillin were the most commonly prescribed antibiotics in Kabul (21). As of today, self-medication with antibiotics has not been investigated in Afghanistan. Therefore, the aim of this study was to find, the prevalence of self-medication with antibiotics and antibiotics used for self-treated disease. The result can be used in making and implanting effective policies and awareness programs regarding problems and adverse effects of self-medication.

Material And Methods

This cross-sectional survey was carried out in Kabul in 12 community pharmacies located in 4 different regions (south, east, west and north), covering the entire city, from May to November 2017.

Standard questionnaire was developed based on previous similar studies, and specific cultural respects. The validity and reliability of the questionnaire was evaluated in a pilot study. questions about demographic information (age, tribe, place birth, degree of study), drug knowledge (definition, quality, cost), types of antibiotics that were used for self-medication (penicillin, cephalosporin, macrolides, aminoglycosides, metronidazole, cotrimoxazol), the reasons for antibiotic self-medication (inaccessibility to doctors and healthcare center, lack of time, economic problem, easy access to all kind of drugs) were included and were designed as open and close ended questions.

The study population were people of different age and both sex who came to the designated pharmacies during the study period. They were asked to fill out the questionnaire at the pharmacy, after reading and

singing the agreement. Respondents under 18 and those with career related to health care were not included in this study.

To determine the sample size, Single proportion formula was used, which is $n = z^2 pq/d^2$, where z is estimated at 1.96 for a 95% confidence level, P is 50% of the estimated prevalence and d is the level of acceptable error estimated at 5%. the sample size was determined to be 385. After collecting all questionnaire from each pharmacy, the data was analyzed using SPSS 16.0

Results

385 participants from 12 community pharmacies were included in the study to assess their antibiotic self-medication practice. Of total respondents 61.29% of them were male and 38.70% female. 35.32% of participants were between 18–24 years and 29.87% were 25–34 years of age and the majority (50.12%) of the participants had only primary level of education.

| Table 1: general characteristics of the participants | |
|---|-------------|
| Variables | N (%) |
| Gender | |
| Male | 236 (61.29) |
| Female | 149 (38.70) |
| Age | |
| 18-24 | 136 (35.32) |
| 25-34 | 115 (29.87) |
| 35-44 | 76 (19.74) |
| >45 | 58 (15.06) |
| Level of education | |
| primary and basic | 193 (50.12) |
| bachelor | 147 (38.18) |
| master | 36 (9.35) |
| PhD | 9 (2,33) |

From the total participants, 73.25% had practiced antibiotic self-medication (81% once, 11.26% twice and 7.74% more than 2 times during the last year) (*figure 1*)

The reasons for antibiotic self-medication was stated as economic problems (26.95%), lack of time to go to the doctor (22.69%), comfortability (21.63%), lack of confidence on doctors and health care centers (17.37%), and lack of access to health care facilities (11.34%) (*figure 2*).

The common illnesses/symptoms that required antibiotic self-medication were cough (28.01%), common cold (14.89%), respiratory infections (13.47%), sore throat (12.41%), diarrhea (7.44%), nasal congestion (7.09%), fever (6.02%), toothache (3.9%), vomiting (3.54%), and skin disease (3.19%) (*figure 3*).

The antibacterial agents mostly used for self-medication included; penicillins (25.17%), metronidazole (15.60%), ceftriaxone (14.18%), tetracycline (10.28%), Azithromycin (9.21%), cefixime (7.09%), ciprofloxacin (6.73%), Cotrimoxazole (4.25%), Erythromycin (3.54%), doxycycline (2.48%), Gentamycin (1.41%) (*figure 4*)

The source of information for antibiotics self-medication were pharmacies (44.32%), leftover drugs, (23.75%), self-experience (19.50%), and advices from friends/relatives (12.41%) (*Figure 5*).

types of antibiotic (31.20%), indication (22.69%), price (19.85%), brand (15.24%), and safety of antibiotic (10.99%) were the common factors considered in selecting antibiotics for self-medication (*figure 6*).

The sources for determining the dosage of antibiotics for self-medication was stated as asking a pharmacist (25.17%), using drug's package insert (21.63%), previous experience (21.27%), asking a doctor (17.73%), asking friends and relatives (5.31%), searching in internet (4.6%), and estimation (4.25%) (*figure 7*).

(41.48%) always, (42.55%) sometimes and (15.95%) never read the drug's package insert before consumption. 121 (63.02%) participants partially and 45 (23.43%) participants completely know the package insert's information.

Regarding combination use of antibiotics, (50.35%) of respondents stated the use one antibiotic, (29.07%) 2 antibiotics and (20.56%) 3 and more antibiotics at a time during self-medication (*figure 8*)

To know the duration of antibiotic self-medication, we asked when they stopped the use of antibiotic, (32.97%) stated on completion of treatment, (24.46%) after improvement of the symptoms, (20.56%) in a few days after relief, and (11.34%) after consultation with doctor or pharmacist and (10.63%) in a few days of treatment (*figure 9*).

To understand the adverse effect of antibiotic self-medication, we asked about any side effect the participants had experienced with antibiotic self-medication, and what action they had taken for that effect, out of the participant who had practiced antibiotic self-medication, 93 (32.97%) respondents had experienced side effects during antibiotic self-medication of whom (46.23%) stopped the drug, (32.25%) visited a doctor or pharmacist, (21.50%) asked a friends and relative.

Of the total participants (40.51%) stated antibiotic self-medication as very bad practice, (32.72%) stated it as bad practice, (25.45%) stated it as accepting practice and (1.29%) stated it as good practice. Only 61 (26.63%) of those who had practiced self-medication were confident of their ability to treat disease in self-medication. We asked whether the participant had any concern regarding antibiotic self-medication, of the total participants (62.59%) stated they were very concerned, (26.75%) were partially concerned and (11.68%) were not concerned.

Discussion

Our study showed that, the prevalence rate of self-medication with antibiotic was 73.25% in Kabul. which is almost similar to Greece (74.6%) (22), Sudan (73.9%) (23) and is higher than Bhutan (23.6%), Bangladesh (26.69%) (24), china (47.8%) (25), UAE (56%) (26), India (39.4%), Indonesia (45%) (27), Saudi Arabia (40.8%) (24). In another study the prevalence of antibiotic self-medication in South Asian region was reported 7.3% to 85.59%, with an overall prevalence of 42.64% (27). again compared to this study, the prevalence is very high in Kabul, the reasons could be poor education level, low quality of health care services and poor access to health care centers, high cost of health care services in private health centers which make them unaffordable to people, easy access to antibiotics and pharmacy, lack of time and long queues in public health care centers.

In our study we found a significant association between educational level and the use of antibiotics for self-medication in a way that antibiotic self-medication was more prevalent among participants with basic and primary education level than those with bachelor and master degree ($p = 0.04$), this may be explained by the fact that participants with higher education level had better awareness of adverse effects and problems related to antibiotic self-medication, this finding is in consistent with similar studies in Saudi Arabia, UAE, Pakistan and India (23).

The common reasons for practicing antibiotic self-medication was stated as comfortability of the method, lack of time to go to the hospital or health care center and economic problems. These findings are similar to studies in other countries, in Nigeria (23) for instance long stays, remoteness and expensive health care services was found the main reasons, on the other hand in Saudi Arabia (23) previous experience of similar disease and problems in gaining medical aid were the sated the most common reasons and in Pakistan (29) saving the time, avoiding the troubles of visiting a doctor and prior knowledge was mentioned as the reasons for antibiotic self-medication.

In our study the participant also mentioned lack of health care facilities, economic problems, lack of confidence in health care services and easy access to all kind of antimicrobial agents as the common reasons for self-medication with antibiotic, which are inconsistent to other studies. the possible reasons for these difference in Afghanistan can be limited number of public health care facilities with high crowds of patients, poor quality of health care services in public hospitals and high cost of health services in private hospitals, lack of health insurance, poor knowledge and wrong thoughts among people, easy access to all kinds of antimicrobial drugs, high inclination of pharmacies for selling medicines, and advertisements.

The study showed that penicillin's (25.17%), metronidazole (15.60%), ceftriaxone (14.18%), tetracycline (10.28%), Azithromycin (9.21%), cefixime (7.09%), and ciprofloxacin (6.73%), were the most commonly self-medicated antibiotics, which is similar to the results from other studies. For instance, penicillins in Iran (22), amoxicillin in United Arab Emirate (30), metronidazole and ampicillin/cloxacillin, in Nigeria (28), Metronidazole in Pakistan (29), azithromycin (55.6%) followed by amoxicillin in India (31), and Amoxicillin-clavulanic acid in Saudi Arabia (23) were reported the most commonly self-medicated

antibiotics. These can be clarified by the fact that the above mentioned antibiotics are of low price, widely prescribed by physicians and the people have been very familiar with them.

The study showed that the major source information for antibiotic self-medication was pharmacist (25.17%), drug's package insert (21.63%), previous experience (21.27%), asking a doctor (17.73%). Which is in consistent with the results of some other studies in Iran, Pakistan, Turkey, Jordan and Greece (22), Nigeria (28), Saudi Arabia (23), and United Arab Emirate (30). According to the result, community pharmacies were the most common source of obtaining antibiotics for self-medication. As most of the people working as pharmacy drug sellers are nonprofessional, and did not have sufficient training and knowledge of the antimicrobial agents and the disease, On the other hand, due to conflict of interest, they are not willing to lose their customer due to economic issues. These drug sellers as a source of advising antibiotic, can be the major source of irrational antibiotic use and antibiotic resistance.

As stated by the participants of our study, the common illnesses/symptoms that necessitate self-medication with antibiotics were cough (28.01%), common cold (14.89%), nasal congestion (7.09%), sore throat (12.41%), fever (6.02%), vomiting (3.54%), diarrhea (7.44%), and respiratory infections (13.47%), similar conditions were stated as the main reasons for antibiotics self-medication in other countries such as Palestine (30), Yemen (22), Malaysia (31) and Jordan (22), influenza in United Arab Emirate (30), upper respiratory tract infections in Saudi Arabia (23), Fever and cold in different South Asian counties (27) was the major pathological reason which was treated with prescribed or self-medicated antibiotics. Which are almost similar to our findings, the little difference could be due to epidemiology and endemicity of the disease and time of the study.

As stated by the participants of our study, only 52.92% completed the course of antibiotic therapy. the dosage of Antibiotic for self-medication was determined by asking a pharmacist (25.17%), using drug's package insert (21.63%), previous experience (21.27%), asking a doctor (17.73%), asking friends and relatives (5.31%), searching in internet (4.6%), and estimation (4.25%). Only (41.48%) always, read the drug's package insert, and only 45 (23.43%) participants completely know the package insert's information. (20.56%) in a few days after relief, and (10.63%) in a few days of treatment ceased antibiotic consumption. 93 (32.97%) respondents had experienced side effects during antibiotic self-medication. these finding shows that, antibiotics are used with inappropriate dose, insufficient duration, and without sufficient knowledge, which can cause irrational antibiotic use and resistance.

Conclusions

Our study showed a very high prevalence (75.53%) of antibiotic self-medication in Kabul. high crowds, long distance, and limited number of health care facilities, unaffordable and high cost of health care services, poor confidence in health care services, low level of education, incorrect perception and easy access to all kind of antibiotics were found the main causes for this high prevalent antibiotic self-medication in Afghanistan. In most cases antibiotics for self-medication were used with incorrect dose, insufficient duration, wrong indication and some participants had experienced adverse effects. This

widespread antibiotic self-medication and use in Afghanistan has increased the risk of antimicrobial resistance and will be a great treat to public health.

To decrease the prevalence of antibiotic self-medication and improve the rational use of antibiotics, policies for regulation and control of selling antibiotics without prescription should be developed and implemented, only pharmacists or professional peoples should be permitted to work in pharmacies, awareness and antibiotic stewardship programs should be implemented in the society by government, media, and health care authorities. accessibility to health care services should be increased, quality of health care services should be improved and the cost should be decreased in order to increase patients' satisfaction in health care system.

Declarations

Author contributions:

RR conceived and designed the study and wrote the manuscript. SHM performed the statistical analysis and wrote the manuscript. AA and MM critically revised the manuscript and approved the final version.

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Ethical approval Ethical

Ethics approval and consent to participate this study was approved by the Research Committee of Medicine faculty of Kateb University with approval numbers: FoP.14, 12/ 7/ 2018. The research committee of medicine faculty is considered the local research review board.

Competing Interests

None declared.

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Figures

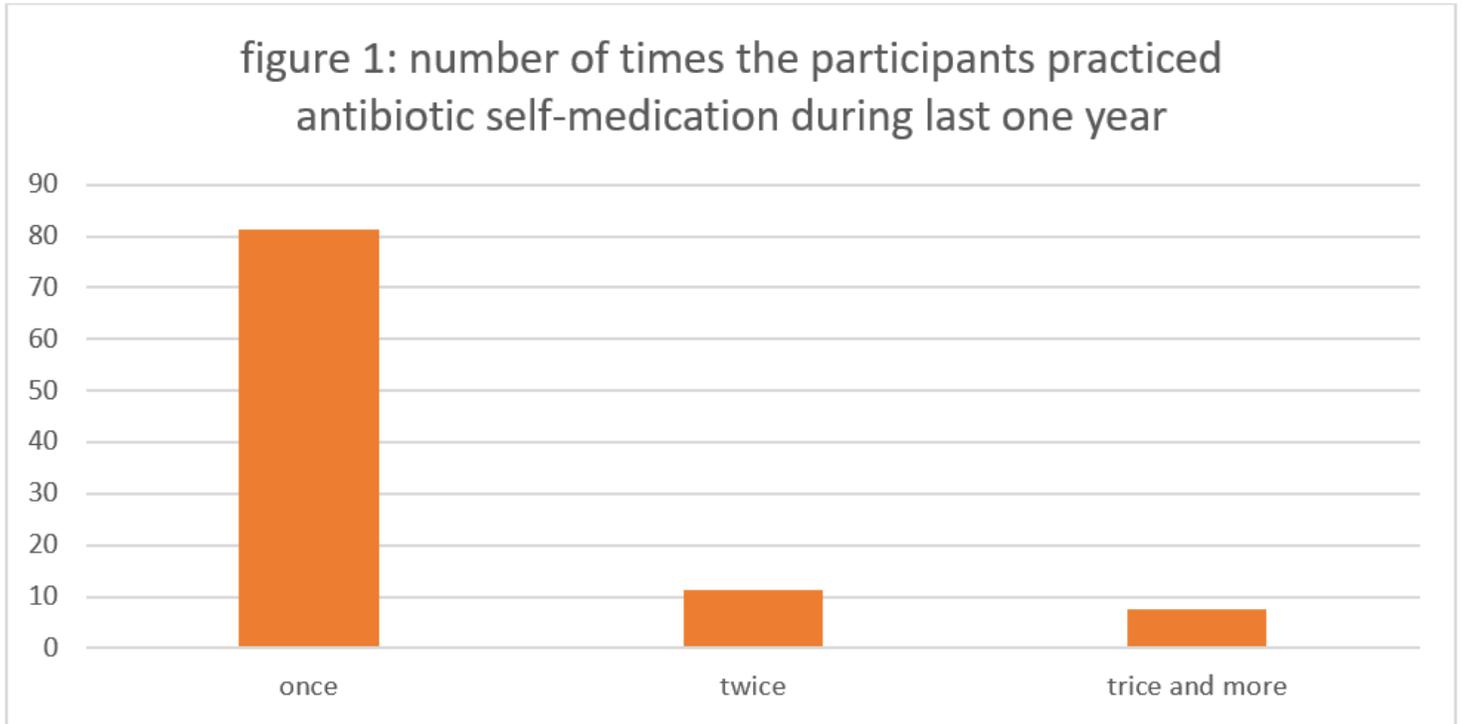


Figure 1

Number of times the participants practiced antibiotic self-medication during last one year

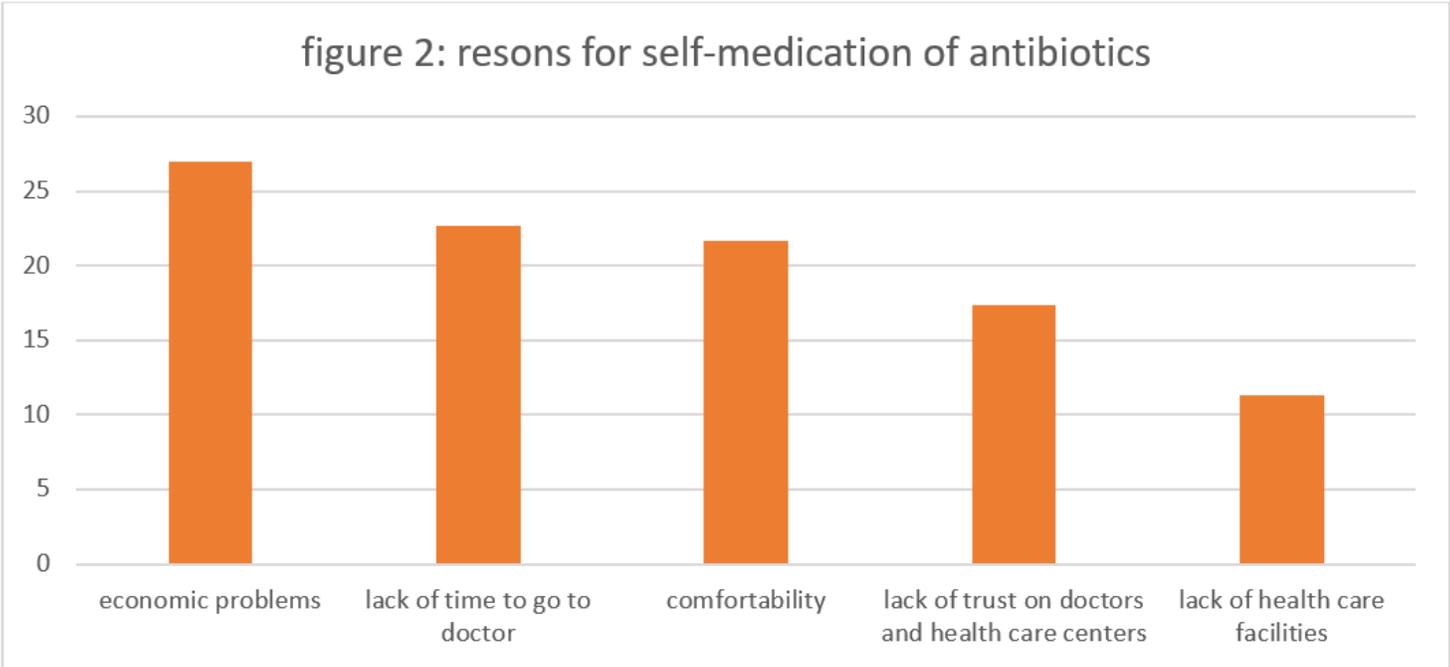


Figure 2

Reasons for self-medication of antibiotics

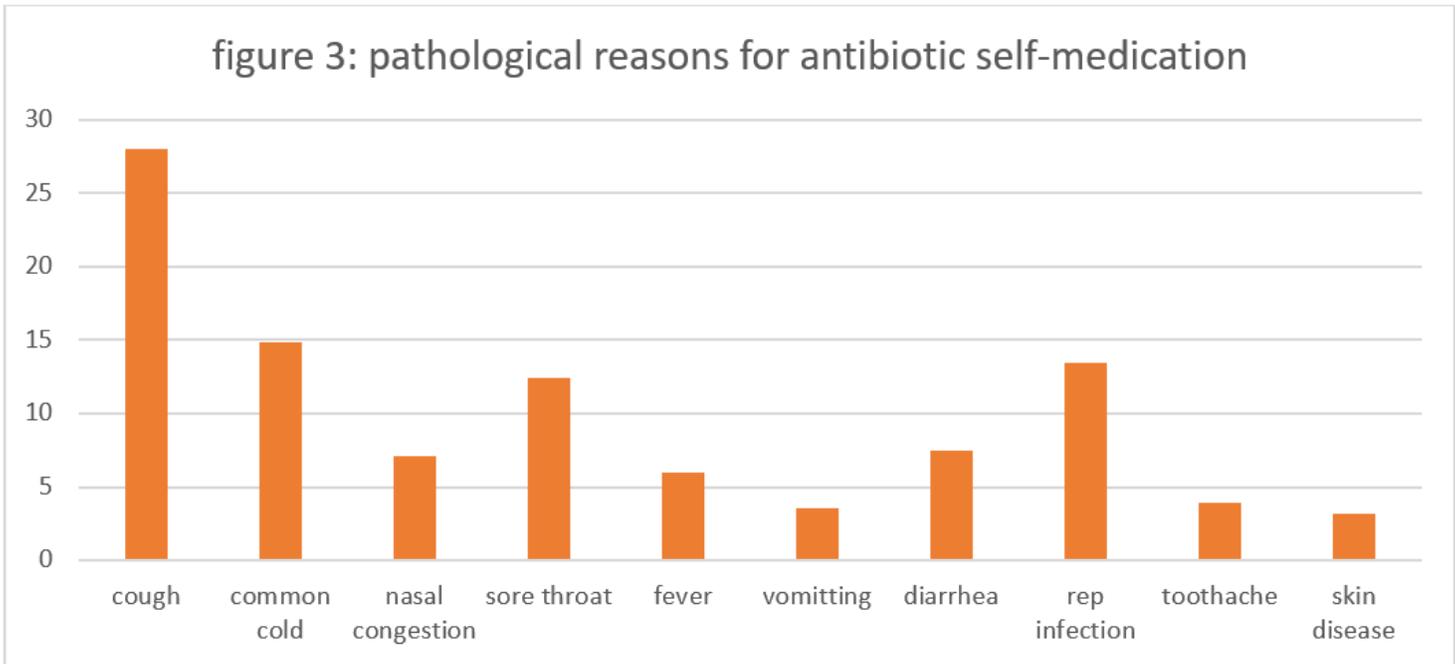


Figure 3

Pathological reasons for antibiotic self-medication

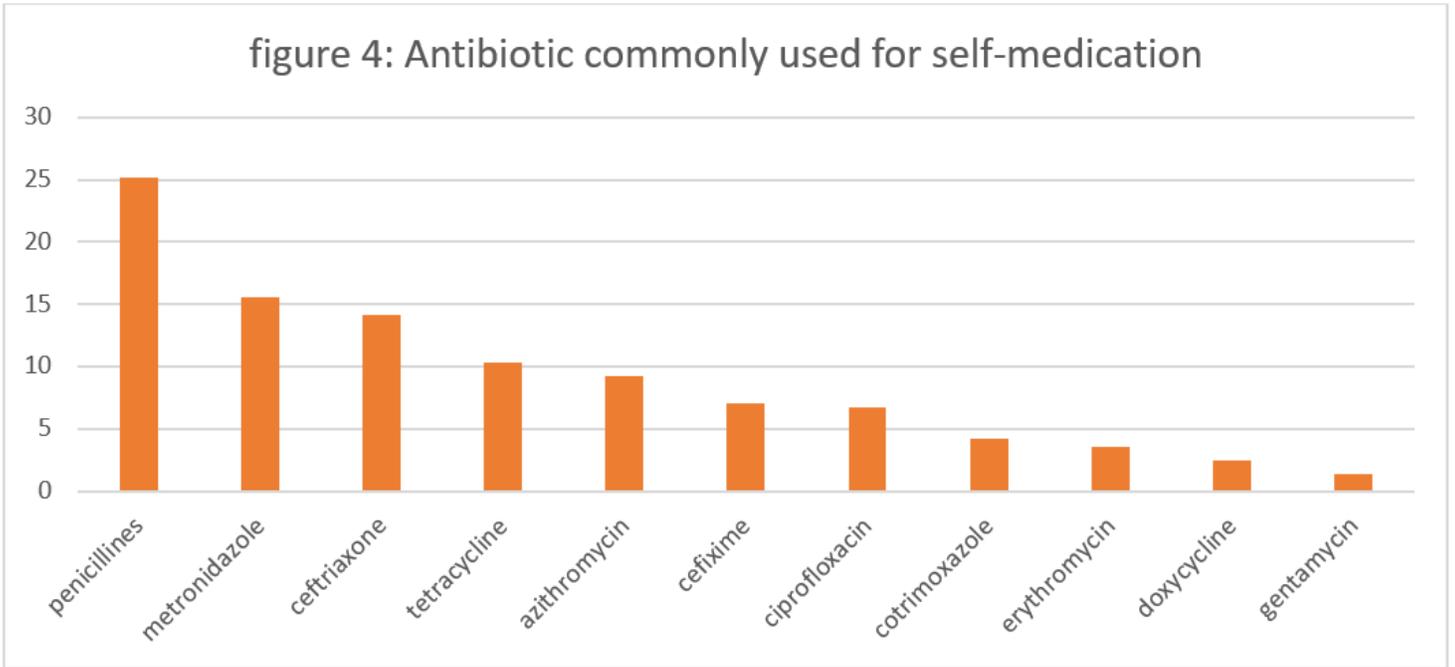


Figure 4

Antibiotic commonly used for self-medication

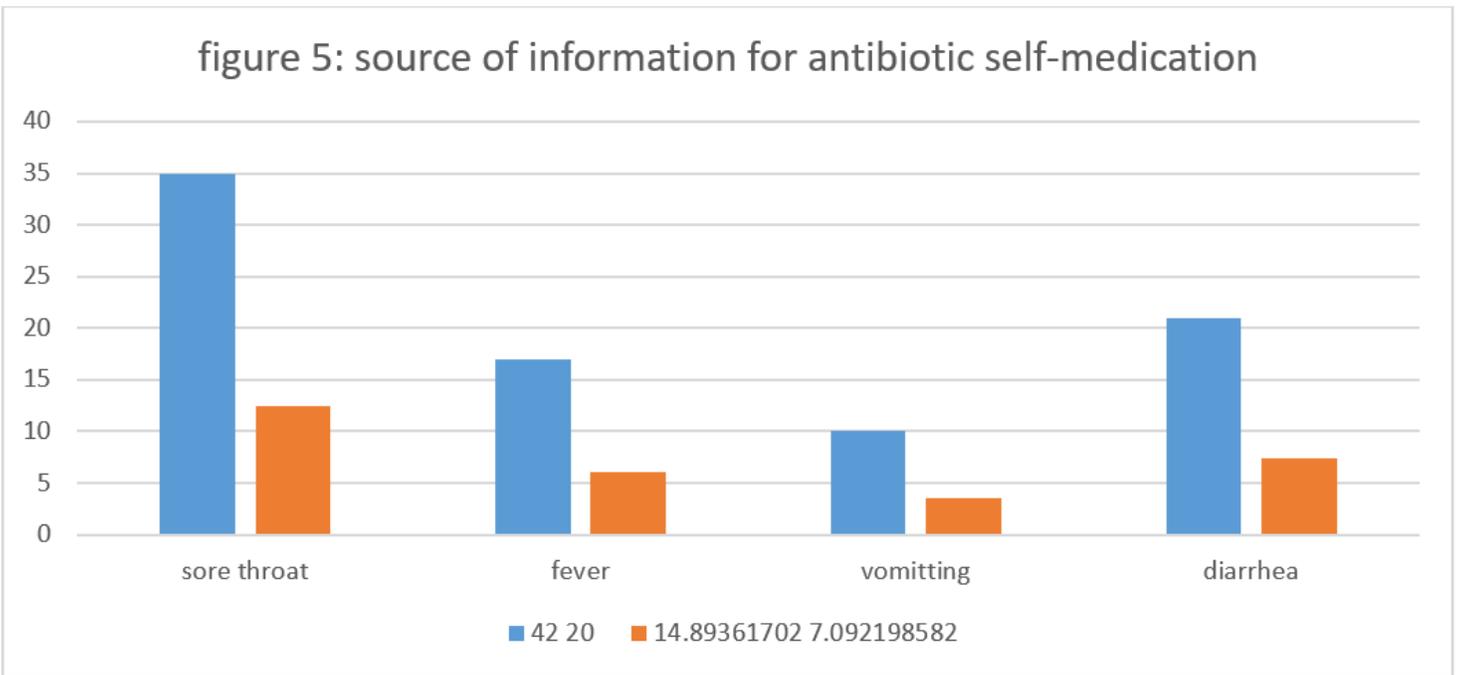


Figure 5

Source of information for antibiotic self-medication

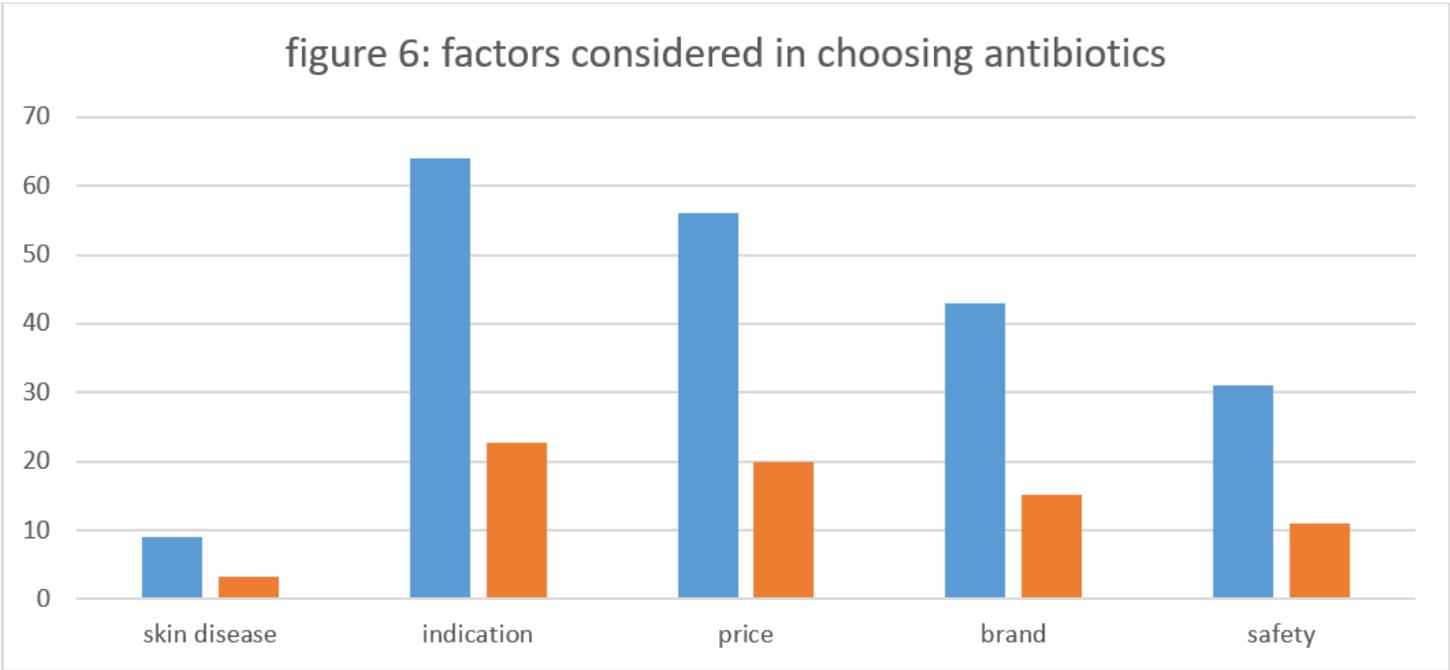


Figure 6

Factors considered in choosing antibiotics

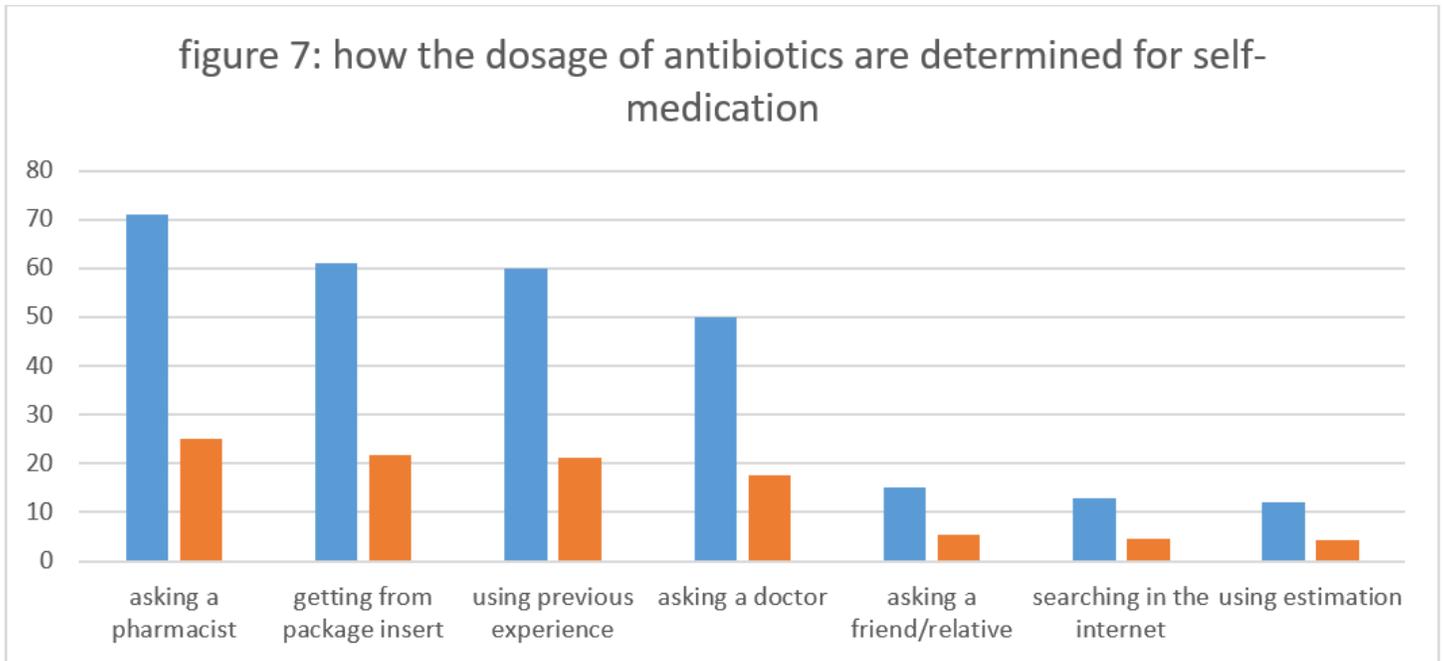


Figure 7

How dosage of antibiotics are determined for self-medication

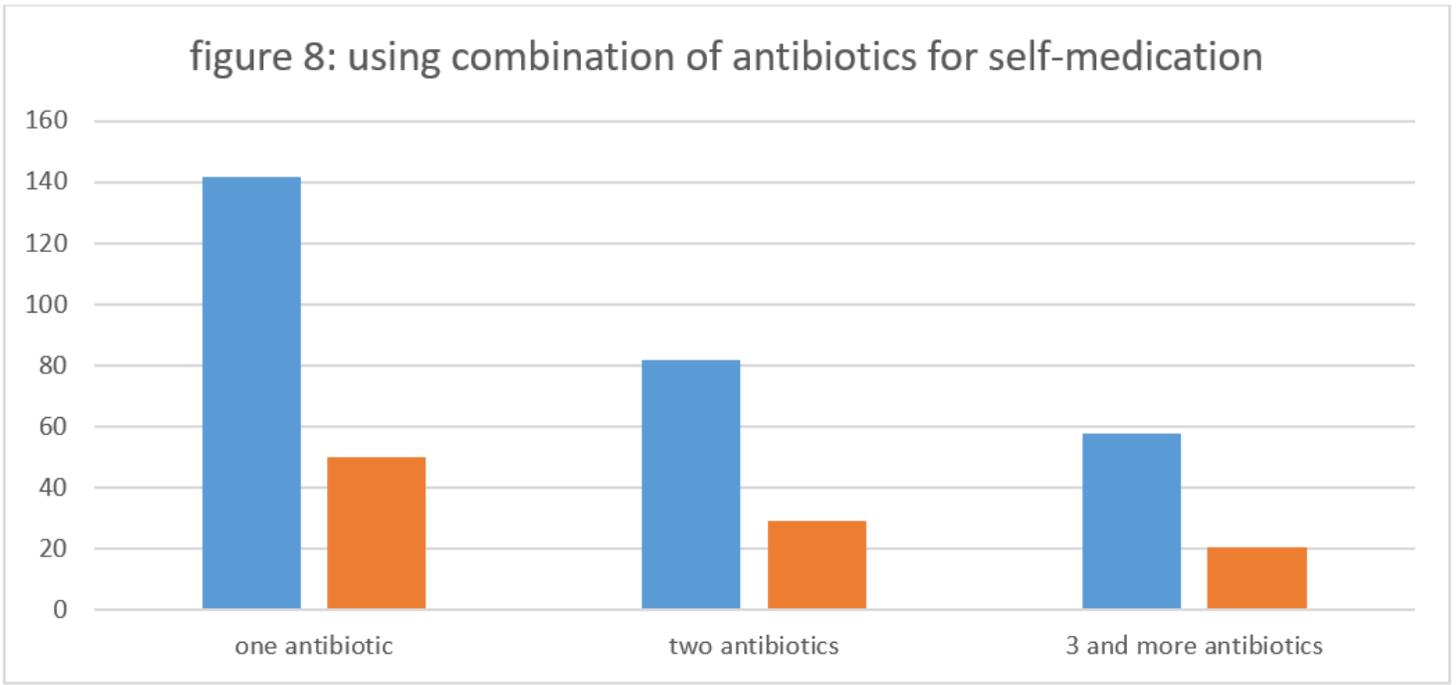


Figure 8

Using combination of antibiotics for self-medication

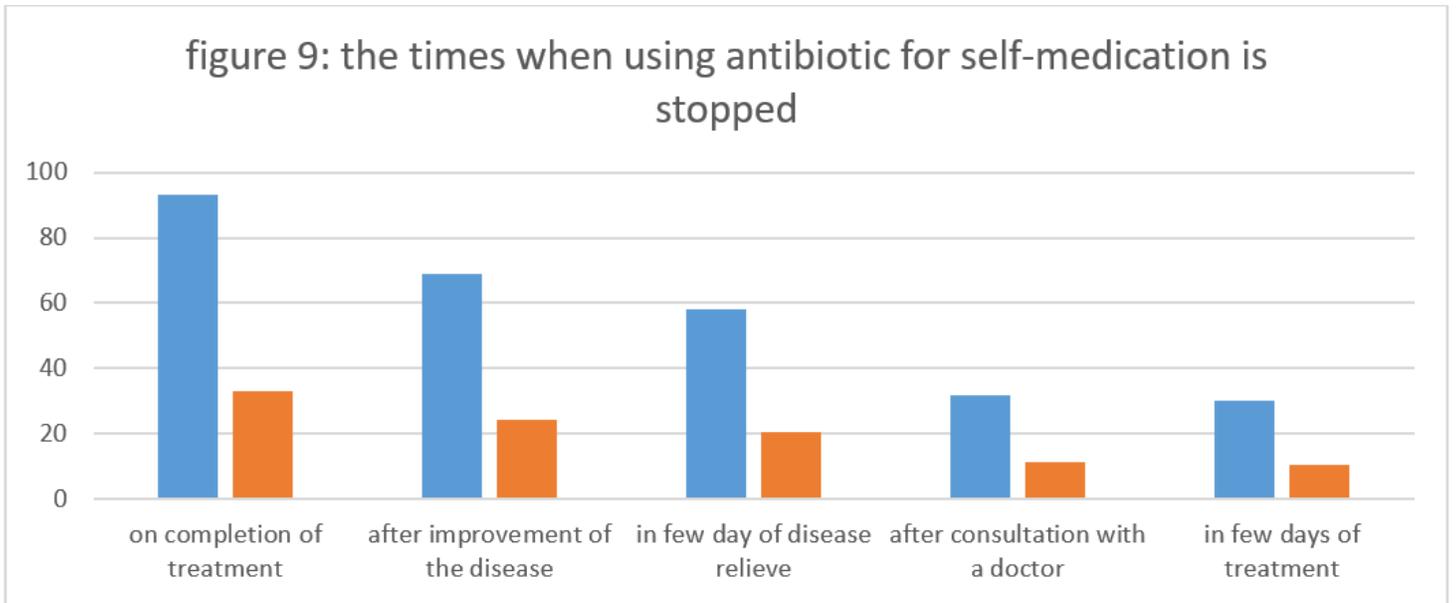


Figure 9

The times when using antibiotic for self-medication is stopped