



## ANTIBIOTIC DISPENSING WITHOUT PRESCRIPTION IN COMMUNITY PHARMACIES, DHAMAR PROVINCE, YEMEN

Ahmed G. Al-Akydy<sup>1\*</sup>, Ahmed Al- Washli<sup>2</sup> and Abdulrahman Y. Al-Haifi<sup>3</sup>

<sup>1</sup>Department of Pharmacology and Therapeutics, Faculty of Medicine and Health Sciences,  
Thamar University, Dhamar, Yemen.

<sup>2</sup>Department of Pharmacy, Faculty of Medical Sciences, Al-Saeeda University, Dhamar,  
Yemen.

<sup>3</sup>Department of Microbiology, Faculty of Medicine and Health Sciences, Thamar University,  
Dhamar, Yemen.

Article Received on  
10 Nov. 2017,

Revised on 30 Nov. 2017,  
Accepted on 20 Dec. 2017

DOI: 10.20959/wjpps20181-10780

### \*Corresponding Author

**Prof. Ahmed G. Al-Akydy**

Department of  
Pharmacology and  
Therapeutics, Faculty of  
Medicine and Health  
Sciences, Thamar  
University, Dhamar, Yemen.

### ABSTRACT

**Background:** The dispensing of antibiotics without medical prescription has been observed in many countries, particularly, in developing countries, including Yemen, where the legislations and regulations are weak. **Objective:** To investigate the common practice of dispensing antibiotics without prescription in community pharmacies in Dhamar region, Yemen. **Methods:** A cross-sectional study was carried out among 252 community pharmacists between April and July 2016. This was achieved by using a structured questionnaire developed and modified by the authors and completed by the pharmacists themselves. **Results:** The results showed that 96% of studied community pharmacists who participating in this study dispensed antibiotics without prescription, whereas 4% of pharmacists

dispensed antibiotics with medical prescription. The most antibiotics dispensed without prescription for both children and adult were penicillins (39.3% and 29.5% respectively). Penicillins were the most antibiotics dispensing without prescription based on the patient's demand (20.3%), whereas 12.9% of the pharmacists dispensed penicillins without prescription based on their experience. The highest percentage for dispensing the antibiotics without medical prescription was for cough(19.2%), sore throat(16.1%), common cold (11.5%), followed by urinary tract infections(10.7%). **Conclusion:** The unwarranted antibiotic prescribing and dispensing antibiotics without prescription were common among

community pharmacists in this study. Low knowledge, easy availability of antibiotics without prescription and uncommitted of occupational ethics were the most common causes of dispensing of antibiotics without prescription. Effective strategies involving regulatory enforcement prohibiting sales of antibiotics without prescription should be implemented along with educational interventions for health professionals and the population.

**KEYWORDS:** Antibiotics, community pharmacist, resistance, non-prescription, self-medication.

## INTRODUCTION

In several countries and for many illness episodes, local private pharmacies may form the only health service, where the people can make contact.<sup>[1,2]</sup> Antibiotics(Abs) have revolutionized the treatment of common bacterial infections and have played a vital role in reducing morbidity and mortality of many infectious diseases.<sup>[3,4]</sup> Abs, while often classified as prescription -only medicines, can be purchased without prescription from various drug outlets and community pharmacies in several countries around the world.<sup>[5,6]</sup> Several studies in developing countries revealed that 60 – 80% of health problems are treated through self-medications.<sup>[2,7,8]</sup> Dispensing Abs without medical prescription does not only promote antibiotic resistance, but can also promote adverse events including adverse drug effects, high cost of treatment, masked diagnoses, use of excessive drug dosage, prolonged duration of use, drug interactions, polypharmacy and superinfection.<sup>[2,5,9,11]</sup> Sale of antibiotics without prescription for treatment of infections of pregnant women increases the risk of complications in their fetus, for example, use of doxycycline during pregnancy causes permanent tooth discoloration in child.<sup>[2,11]</sup> Growing rates of antimicrobial resistance published worldwide made this a global concern. Despising of Abs either without prescription or based on the pharmacist's counseling, as well as, or misused of Abs by patients, make them important players in this global problem.<sup>[6,12,13]</sup> High rate of self-medication with antibiotics is a universal problem and variations regarding such practices are obvious around the globe: Palestine (98%), Slovenia (92.3%), Croatia (88%), Malaysia (80.9%), Greece (74.6%), China (59.4%), Nigeria (47%), Turkey (45.8%), USA (43%), Jordan (40.7%), Lithuania (39.9%), Ethiopia (38.5%), India (31%) and Finland (28%).<sup>[2,14,17]</sup> In Jordan, two studies conducted by Yousef et al and Bakri et al, showed that the rate of population who received Abs without prescription were 42.5% and 46% respectively.<sup>[18,19]</sup> Lack of regulations or enforcement of existing regulations, failing health systems, lack of professionalism and/or knowledge among

pharmacists and pharmacy staff, demand from customers, financial incentives and business orientation of pharmacies have been suggested as some of the reasons for dispensing Abs without prescription, especially in developing countries. The influence of the pharmaceutical industry, pharmacists' familiarity with treatment options and their belief that doctors would prescribe the same medication and the large number of advertisements encouraging the consumption of medicines were also reported.<sup>[2,6,20,21]</sup> Antibiotic use in Yemen is high and the statistics of the Ministry of Public Health and Population showed that the antibiotics group was the third group which was imported through the years 2002 and 2003 with percentages of 13.7% and 13.0% respectively from the total number of imported drugs.<sup>[22]</sup> Also approximately 60% of children patients in Yemen received Abs without prescription.<sup>[23]</sup> Despite government's efforts at putting legislations in place, the effective regulation of medicines and the practice remains a challenge for the pharmaceutical sector.<sup>[2,24]</sup> In many middle-income countries, including Yemen, the pharmacists have the potential to contribute to primary healthcare, however, there are deficiencies in the quality of current professional practice, particularly, the inappropriate sale of antibiotics.<sup>[2]</sup> As well as, patients can purchase Abs without a prescription, therefore we hypothesized that inappropriate antibiotic prescribing and dispensing, in Yemen is common.<sup>[13]</sup> For the change of this practice, it is very important to understand the attitudes and beliefs of pharmacists and other health professionals regarding this practice and the impediments to achieve best practice.<sup>[2,6]</sup> Although very few studies have investigated pharmacists' attitudes and practices regarding the use of Abs without prescription in many countries,<sup>[6,9]</sup> the role of community pharmacists in ensuring the safe use of Abs in Dhamar province, Yemen, has not been evaluated until the date of this study. The objective of this study was to investigate the common practice of dispensing Abs without prescription in community pharmacies in Dhamar province, Yemen.

## **MATERIALS AND METHODS**

### ***Study Area and Study Population***

The present study was carried out in Dhamar province, which located about 100 kilometers south of the capital city of Yemen, Sana'a. Dhamar province was chosen because of the socioeconomic status of the population living in this region, where medication dispensing without prescription is a very common practice. The study sample was pharmacists who worked in community pharmacies during the study period.

### ***Study Design***

A cross-sectional study carried out between April and July 2016. Socio-demographic data and practicing of pharmacists regarding dispensing of Abs without prescription were collected by using a semi- structured questionnaire containing both open- and close-ended (multiple-choice) questions. The questionnaire was modified from the earlier one which was used by Abuirmeilehet *al.*,<sup>[19]</sup> and others.<sup>[25,26]</sup>

The questionnaire developed in English, translated into Arabic language and back-translated into English to validate the translation. The questionnaire was pretested and these first interviews were excluded from the analysis.

The final version of questionnaire was divided to three parts:

1. Part 1: Socio-demographic Characteristics: this part of questionnaire contained four questions were pertained to collect socio-demographic characteristics of the pharmacists (age, gender, marital status, economical status, place of residence).
2. Part 2: Qualifications and experiences: this part included two questions were pertained to evaluate the level of education and the number of years of practice experience of the participants.
3. Part 3: Antibiotic dispensing: part three consisted of five questions related to the pharmacists practices regarding dispensing of Abs without prescription. The participants were asked to indicate to the most Abs for both kids and adults. The approximate number of times of dispensing Abs per day was evaluated. The participants were asked to indicate to the most Abs dispensing without prescription based on both of the patient's demand and the pharmacist's prescription. also this part included questions related to pathologic medical cases and other symptoms, where the Abs are the most dispensed without prescription.

### ***Sample Size***

The final version of the questionnaire randomly distributed to 300 pharmacists practicing in community pharmacies.

### ***Study Procedure***

During the distribution of the questionnaire to the pharmacists in the selected community pharmacies, an explanation of the purpose of the research and assurance of anonymity were provided to participants, as well as, verbal informed consents were obtained. All the

pharmacists were asked to fill out the questionnaire. After the pharmacists completed the questionnaire, the questionnaire manually was collected and the questionnaire's data were transferred to tables to facilitate the statistical analysis.

### *Statistical Analysis*

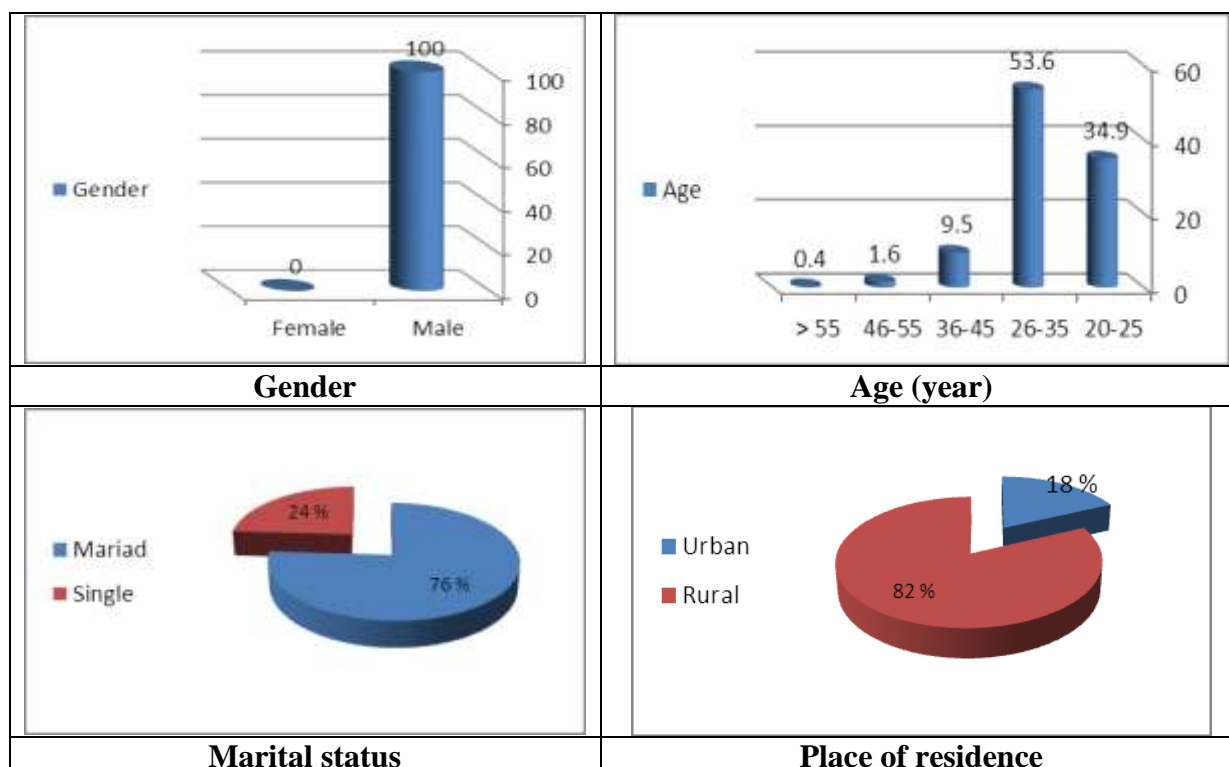
The data was entered after looking for incomplete responses manually and analyzed by using Excel software program. Results were presented as frequencies, percentages in tables or figures for categorical variables.

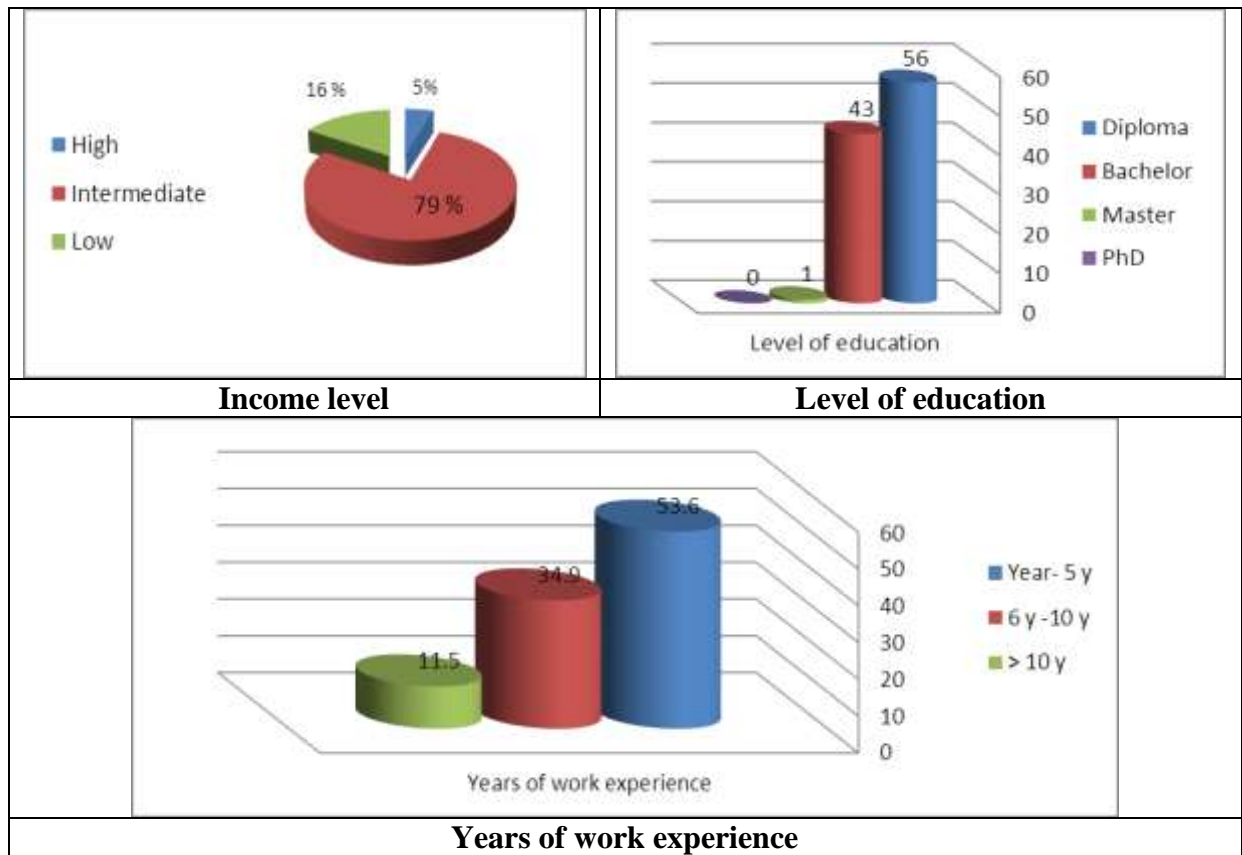
### *Ethical Approval*

The college of Medical Sciences, Al-Saeeda University approved the study protocol. Verbal consent was obtained from each pharmacist in charge to participate in the questionnaire. Any information that exposes the identity of the pharmacists who participate in the questionnaire was avoided.

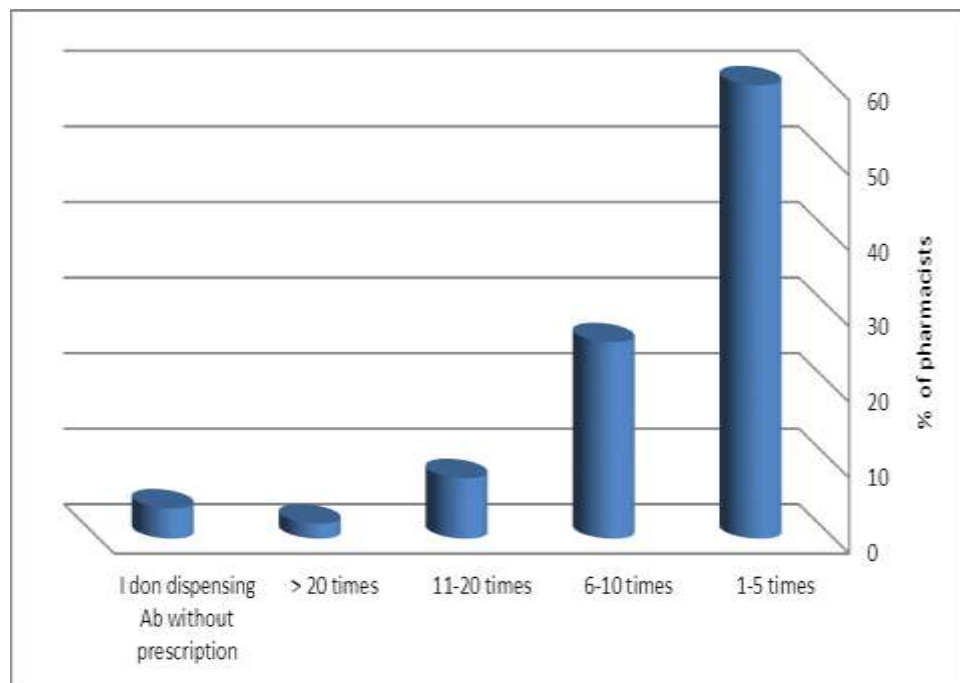
## RESULTS

A total of 252 out of 300 administered questionnaires were returned fully completed and met the inclusion criteria, giving a response rate of 84%. Forty eight pharmacists(16%) were excluded due to incomplete data. The results are illustrated as tables and figures to facilitate their presentation and explanation as follow:





**Fig. 1: Socio-demographic data of participating community pharmacists (n=252).**



**Fig. 2: Number of times of Dispensing Abs without medical prescription per day.**

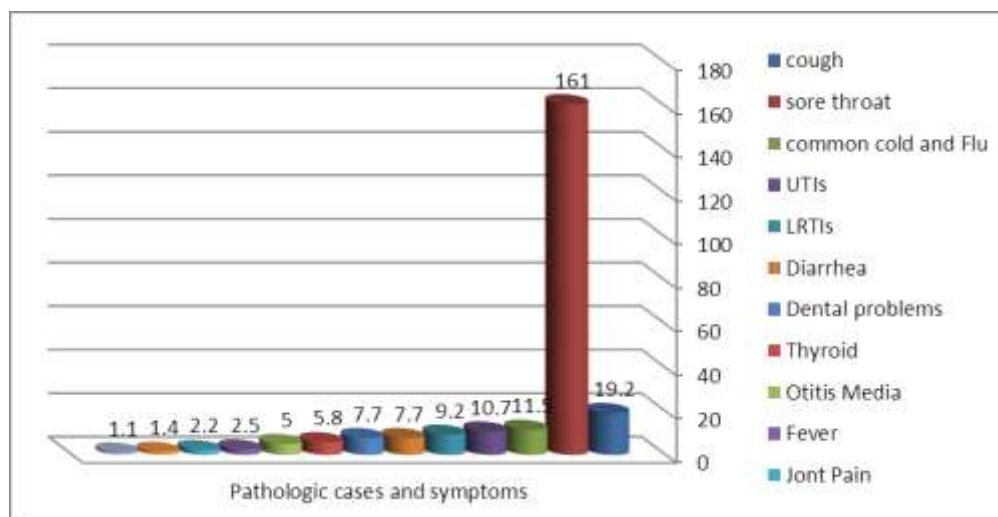
**Table 1: Types of Abs dispensed for adult and pediatric patients without prescription.**

Antibiotic	Adults		Children	
	F	%	F	%
Penicillins	167	29.5	209	39.3
Cephalosporins	79	13.9	35	6.6
Macrolides	29	5.1	9	1.7
Aminoglycosides	32	5.6	34	6.4
Fluoroquinolones	50	8.8	9	1.7
Tetracyclines	13	2.3	10	1.9
Lincomycin	5	0.9	63	11.8
Co-trimoxazole	37	6.5	63	11.8
Augmentin	146	25.7	95	17.9
Metronidazole	9	1.6	5	0.9
Total	567	100	532	100

**Penicillins** = amoxicillin, ampicillin; **Cephalosporins**= ceftriaxone, cefotaxime, cefepime; **Macrolides** = erythromycin, azithromycin; **Aminoglycosides** = gentamicin; **fluoroquinolone** s= ciprofloxacin, ofloxacin; **tetracyclines**; lincomycin; co-trimoxazole; **Augmentin** = Amoxicillin/ clavulanic acid.

**Table 2: The most common Abs dispensed basis on the pharmacist experience and the request of the patient.**

Antibiotic	Pharmacy experience		Patients demand	
	F	%	F	%
Penicillins	50	9.9	209	57.8
Cephalosporins	196	39	13	3.6
Macrolides	27	5.4	5	1.4
Aminoglycosides	13	2.6	6	1.7
Fluoroquinolones	57	11.3	6	1.7
Tetracyclines	6	1.2	21	5.8
Lincomycin	0	0	0	0
Co-trimoxazole	14	2.8	16	4.4
Augmentin	130	25.8	75	20.8
Others	10	2	10	2.8
Total	503	100	361	100



**Fig. 3: The most common pathologic cases and symptoms that pharmacist dispense Abs without relying on prescription.**

## DISCUSSION

The availability and use of Abs without prescription in community pharmacies is not well understood and the role of pharmacists in antibiotic utilization and health-seeking behavior is often overlooked. Reports have shown that non-prescription sale of antibiotics is prevalent in all communities of the world, particularly, in developing countries.<sup>[5,6,9, 27,28]</sup> However, the role of community pharmacy in ensuring the safe use of antibiotics in Dhamar province, Yemen has not been evaluated.

## Scio- Demographic Data

A total of 252 out of 300 administered questionnaires were returned fully completed and met the inclusion criteria, giving a response rate of 84%. All participants (100%) were males. This can be attributed to the traditions of the region of the study, where female can't work in the community pharmacies. The highest level of education for participants were Diploma (54%), while Bachelor and Master degree represented 42% and 1% respectively. Most of pharmacists (82%) were from urban population and 18% of the pharmacists were from the rural population.[Fig. 1].

## Antibiotics Without Medical Prescription

The results of our study clearly demonstrated that Abs could be easily acquired and sold in Dhamar province without the need to supply a medical prescription to the pharmacist (96%) [Fig. 2]. The highest dispensing of Abs without prescription in Yemen can be attributed to the ease of the obtaining of Abs from the community pharmacies without prescription. Similar to



these results, Al Akhali et al, 2013, found that 82% of patients in Dhamar province, Yemen, took Abs without prescription and all these Abs were dispensed by the professionals of the community pharmacies without a prescription.<sup>[13]</sup> However study conducted in Lithuania showed that only 31.0% of Abs dispensing without medical prescription and the community pharmacies remain the main source of non- prescription antibiotic supply.<sup>[29]</sup> This variance may be due to the differences between study populations and the differences in the outpatient antibiotic consumption among these countries; therefore, it cannot be entirely comparable. The results obtained in this study indicated that the most commonly dispensed Abs without prescription by community pharmacists, were penicillins, particularly amoxicillin, wither for children or adults (39.35% & 29.5%) respectively [Table1]. These results were consistent with three previous studies conducted in Yemen, Jordan and UAE. The study in Yemen showed that the highest dispensing Abs without prescription were penicillins (73.2%).<sup>[13]</sup> The study in Jordan showed that the most dispensing Ab without prescription by community pharmacists for both adults and children was amoxicillin, where, the rate was more than 83.5% and 80% respectively.<sup>[9]</sup> Another study that carried out in the UAE showed that amoxicillin also was the most antibiotic that used as the self-medication by 46% of the sample of the study.<sup>[30]</sup> UAE 's study attributed the highest dispensing of amoxicillin to the ease of obtaining Abs at community pharmacies without prescription.<sup>[30]</sup> Other study carried out in Greece at 2003 revealed that 74.6% of the adults consumed non-prescribed Abs and 22.7% of parents administered non-prescribed Abs to their children.<sup>[31]</sup> In this study, the wide dispensing of amoxicillin can be attributed to its low cost and safety, as well as, amoxicillin has broad effectiveness and it can be used in controlling infections caused by gram positive and gram negative such as, respiratory, gastrointestinal infections. Our results revealed that 60% of the pharmacists dispensed Abs without prescription at frequency of 1-5 times per day[Fig. 2]. This result was agreed with the pervious studyconducted in Jordan revealed that percentage of Abs that were dispended 1-5 times per day was 53.7%.<sup>[9]</sup>

### **Patterns Of Dispensing Antibiotics Without Medical Prescription**

Our results revealed that the most common Abs dispensed without prescription based on the pharmacist's experience were cephalosporins followed by Augmentin (34% and 25.8% respectively), while the most common Abs dispensed without prescription based on the patient's request were penicillins followed by Augmentin (57% and 20.8% respectively) [table 2]. The most common use of non-prescription Abs was to treat cough (19.2%), sore throat (16%), common cold (11.5%), followed by urinary tract infections (10.7%)[Fig.3].

These results were comparable with findings in other previous studies.<sup>[13]</sup> One of these study conducted in Yemen showed that the highest percentage for taking the Abs without medical prescription were for sore throat (54.9%) followed by abdominal pain(10.4%) and urinary tract infections (8.5%).<sup>[13]</sup> Other study carried out in Jordan showed that the most common use of non-prescription Abs was to treat sore throat followed by influenza.<sup>[9]</sup> Study was conducted in Greece showed that pharmacists dispensed Abs without prescription for (69%) and (86%) for cases of rhinosinusitis, with and without high fever respectively.<sup>[32]</sup>

## CONCLUSIONS

This study is the first study elucidates the perceptions of community pharmacists in Dhamar province, Yemen, regarding dispensing and use of Abs without prescription. Unwarranted antibiotic prescribing and dispensing Abs without prescription was common among community pharmacists. Most of pharmacists weren't aware of the legislations regarding selling and use of antibiotics. Effective strategies involving regulatory enforcement prohibiting sales of antibiotics without prescription should be implemented along with educational interventions for health professionals and the population. Finally, The medical education strategies should aim, not only to increase the knowledge, but also to change the behaviour and practices among medical sciences college students.

## ACKNOWLEDGEMENTS

Authors thank the authorities of Medical Sciences College for giving him permission to perform this study in the Al-Saeeda university. We convey my sincere thanks to the all pharmacists who devoted their time to participate in our study. We convey my sincere thanks to the pharmacists who acceptance participated in this study.

## REFERENCES

1. Smith, F. Private local pharmacies in low and middle income countries: a review of interventions to enhance their role in public health, *Tropical Medicine and International Health*, 2009; 14(3): 363- 367.
2. Akinyandenu O, Akinyandenu A. Irrational use and non-prescription sale of antibiotics in Nigeria: A need for change. *Journal of Scientific and Innovative Research*, 2014; 3(2): 251-257.
3. Mtango FD, Neuvians D. Acute respiratory infections in children under five years. Control project in Bagamoyo District, Tanzania. *Trans Roy Soc Trop Med Hyg.*, 1986; 80: 851-858.

4. Ringertz S, Muhe L, Krantz I, et al. Prevalence of potential respiratory disease bacteria in children in Ethiopia. Antimicrobial susceptibility of the pathogens and use of antibiotics among the children. *Acta Paed*, 1993; 10: 843-848.
5. Dooling KL, Kandeel A, Hicks LA, El-Shoubary W, Fawzi K, Kandeel Y, et al. Understanding antibiotic use in Minya district, Egypt: physician and pharmacist prescribing and the factors influencing their practices. *Antibiotics*, 2014; 3: 233-243. doi:10.3390/antibiotics3020233.
6. Dameh M, Norris P, Green J. New Zealand pharmacists' experiences, practices and views regarding antibiotic use without prescription. *J Prim Health Care*, 2012; 4(2): 131-140.
7. Awad, A.I and Eltayeb, I.B. Self-Medication Practices with Antibiotics and Antimalarials Among Sudanese Undergraduate University Students. *The Annals of Pharmacotherapy*, 2007; 41(7): 1249-1255.
8. Abay, S.M. and Amelo, W. Assessment of self-medication practices among medical, pharmacy and health science students in Gondar University, Ethiopia. *J Young Pharmacists*, 2010; 2(3): 306-10.
9. Abuirmeileh A, Samara S, Alkhodari A, Bahnassi A, Talhouni A, Hayallah AM. Antibiotic dispensing without prescription in Jordanian community pharmacies: a pharmacist's perspective. *Bull. Pharm. Sci., Assiut University*, 2014; 37(part 1): 51-63.
10. Osemene KP, Lamikanra A. A study of the prevalence of self-medication practice among university students in southwestern Nigeria. *Trop J Pharm Res.*, 2012; 11(4): 683-689.
11. Goossens, H., Ferech, M., Stichele, R.V. and Elseviers, M. Outpatient antibiotic use in Europe and association with resistance; a cross-national database study, *Lancet*, 2005; 365(9459): 579-587.
12. Mahajan M, Dudhgaonkar S. Deshmukh S. A Questionnaire based Survey on the Knowledge, Attitude and Practices about Antimicrobial Resistance and Usage among the Second year MBBS Students of a Teaching tertiary care Hospital in Central India. *IJPR*, 2014; 4(4): 175-179. DOI:10.7439/ijpr.
13. Al Akhali KM, Alzomar AK, Khan NA and Alavudeen SS. Misuse Of Antibiotics And Awareness Of Antibiotic Hazard Among The Public And Medical Professionals In Tamar Province, In Republic Of Yemen. *Pharmacie Globale (IJCP)*, 2013; 1(4): 1-4.
14. Rizwan, A. K, Self Self-medication with antibiotics : Practices among Pakistani students in Sweden and Finland, 2011.
15. Jain, S., Malvi, R. and Purviya, J. K. Concept of Self Medication: A review, *International Journal of Pharmaceutical & Biological Archives*, 2011; 2(3): 831-836.

16. Olayemi, O. J., Olayinka, B. O. and Musa, A. I. Evaluation of Antibiotic Self-Medication Pattern Among Undergraduate Students of Ahmadu Bello University (Main Campus), Zaria, *Research Journal of Applied Sciences Engineering and Technology*, 2010; 2(1): 35–38.
17. Akinyede, A. A and Banjo, S. O. A review of the Self-medication practices by students of two health training institutions in Lagos. *Nigerian Journal of Pharmacy*, 2011; 3(2): 51-55.
18. Yousef A, Al-Bakri A, Bustanji Y, Wazaify M. Self-medication patterns in Amman, Jordan. *Pharm. World*, 2008; S30: 30- 24.
19. Al-Bakri A. Bustanji Y, Yousef A. Community consumption of antibacterial drugs within the Jordanian population: sources, patterns and appropriateness. *Int. J. Antimicrob. Agents*, 2005; 26: 389-95.
20. Rauber C, Feltrin, MR, Piovezan AP. Evaluation of antibiotics dispensing profile in Tubarão, Santa Catarina, Brazil. *Brazilian Journal of Pharmaceutical Sciences*, 2009; 45(4): 787-795.
21. Al-Mohamadi A, Badr A, Bin Mahfouz L, Samargandi D, Al - Ahdal A. Dispensing medications without prescription at Saudi community pharmacy: Extent and perception. *Saudi Pharmaceutical Journal*, 2013; 21: 13–18.
22. SBDMA. Annual Statistical Report-2002. Supreme Board of Drugs and Medical Appliances. Mo P H and P Sana'a; Yemen., 2002; 234.
23. Mohanna M. Self-medication with Antibiotic in Children in Sana'a City, Yemen. *Oman*, 2009; 25: 41-3.
24. Lowe, R. F. and Montagu, D. Legislation, regulation, and consolidation in the retail pharmacy sector in low income countries, *Southern Med Review*, 2009; 2(2): 35-44.
25. Skliros EP, Merkouris A, Papazafiropoulou A, Gikas G, Matzouranis C, Papafragos I. et al. Self-medication with antibiotics in rural population in Greece: a cross-sectional multicenter study. *BMC*, 2010; 11.
26. Grigoryan LJ, Burgerhof J, Degener R, Deschepper C, Lundborg D, Monnet E, et al. Determinants of self-medication with antibiotics in Europe: the impact of beliefs, country wealth and the health care system. *J. Antimicrob. Chemother*, 2008; 61: 1172-9.
27. Sharif SI, Sharif RS. Antibiotics use with and without a prescription in healthcare students. *American Journal of Pharmacological Sciences*, 2013; 1(5): 96-99. doi: 10.12691/ajps-1-5-5.

28. Emeka PM, Al-Omar MJ, Khan TM. A Qualitative study exploring role of community pharmacy in the irrational use and purchase of nonprescription antibiotics in Al -Ahsa. *Eur J Gen Med*, 2012; 9(4): 230-234.
29. Pavydė E, Veikutis V, Mačiulienė A, Mačiulis V, Petrikonis K, and Stankevičius E. Public Knowledge, Beliefs and Behavior on Antibiotic Use and Self-Medication in Lithuania. *Int. J. Environ. Res. Public Health*, 2015; 12: 7002-7016. doi:10.3390/ijerph120607002.
30. Abasaeed J, Vlcek M, Abuelkhair, Kubena A. Self-medication with antibiotics by the community of Abu Dhabi Emirate, United Arab Emirates. *J. Infect. Dev. Ctries*, 2009; 3: 491-7.
31. Mitsi G, Jelastopulu E, Basiaris H, Skoutelis A, Gogos C. Patterns of antibiotic use among adults and parents in the community: a questionnaire based survey in a Greek urban population. *Int J Antimicrob Agents*, 2005; 25(5): 439-43.
32. Contopoulos-Ioannidis DG, Koliofoti ID, Koutroumpa IC, Giannakakis IA, Ioannidis JP. Pathways for inappropriate dispensing of antibiotics for rhinosinusitis: a randomized trial. *Clin Infect Dis.*, 2001; 33(1): 76–82.