

A Knowledge, Attitude and Practices Survey about Antibiotic Misuse Among Pediatric Doctors, Pharmacies and Parents in East of Libya

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Abstract

The emergence and spread of bacterial resistance to antibiotics is a growing problem worldwide, which presents a significant threat to public health globally. The present study was designed to determine knowledge, attitude and practice of antibiotic use. A cross-sectional survey was performed using a questionnaire on a sample randomly selected from east Libya for pediatric doctors, pharmacies and parents. A total of 400 participating subjects were approached to be included in the study, 234 agreed to participate giving a response rate of 58.5%. The awareness of antimicrobial resistant was very high among the pharmacist and doctors responder (96.43%) (93.91%) respectively, in contrast participants parents (41.76%). More than one-third (37.36%) were self-medicated with antibiotics to treat mainly common cold and cough. The reasons of antibiotic misuse in the present study according to the opinion of participant doctors were an empirical use, incorrect dose and low level of education with 68.70%, 18.26%, 13.04% respectively. Pharmacies are the major source of antibiotics reporting more than a quarter 28.57% were sold antibiotic without prescription. These findings presented aid in the assessment of the adequacy of present public educational campaigns to promote specific messages to rationalize antibiotic use, and compensate for knowledge and attitude gaps as an effort towards preventing development of antibiotic resistance.

Keywords: Antibiotics, misuse, self prescribing, Knowledge, Attitude and Practices (KAP) survey, East of Libya.

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INTRODUCTION

The last 50 years have witnessed the golden age of antibiotic discovery and their widespread use in hospital and community settings. Regarded as very effective, safe and relatively inexpensive, antibiotics have saved millions of lives. However, this has led to their misuse through use without a prescription and overuse for self-limiting infections [1-3]. This misuse of antibiotics is currently one of the major public health issues worldwide [4-6]. Although antibiotics are targeted to kill or inhibit the growth of bacteria and have no effect on viral agents, it is often inappropriately used to treat viral infections, such as most of upper respiratory tract infections [7].

Several contributing factors are evidently associated with the overuse of antibiotics both at the patient's (or parents of children) level and doctor's level, namely: cultural factors, behavioral characteristics, socio-economic status, and level of education [8-10]. Furthermore, doctors usually relate

their pattern of over prescribing to patients'/parents' pressure [11]. Also, lack of health education is one of the major contributing factors in the overuse of antibiotics [12]. Self-medication is a very important behavioral aspect that contributes to the misuse of antibiotics [13, 14].

Problems associated with the overuse of antibiotics include development of antibacterial resistance, increasing the burden of chronic diseases, raising costs of health service.

In fact, antibiotic resistance is a growing international threat, with high social costs for communities and severe consequences, such as failure to respond to treatment, prolonged illness, and greater risk of complications and mortality [15]. Rational prescribing practices serve to combat this global public health challenge by preventing antibiotic overuse and misuse [16]. Unfortunately, uptake of this concept has been slow, with fewer than half of all countries having any policies promoting good antimicrobial stewardship

[16]. Despite the effectiveness of antibiotics to treat bacterial infections, they are often inappropriately used to treat viral infections [4]. This overuse is currently one of the major public health issues worldwide [17].

The present study was designed to investigate parents, pediatric doctors and pharmacies in relation to medication usage, the knowledge, attitudes and behaviors of medical practitioners, pharmaceutical providers and consumers and to determine the possible risk factors contributing in this issue.

MATERIALS AND METHODS

A cross sectional study with data collection by designed questioner conducted at East of Libya was carried out to achieve the objective. Study was conducted at geographical area in the hospitals of east of Libya (Benghazi, El-bida, Durna, Toubrk, Almarige, Ajdebia) between January 2018 to February 2019. The sample size was 234 participants out of 400 giving a response rate of 58.5%. The participants were approached to be included in the study were 115 of pediatric doctors from different hospitals in the east of Libya which include 60 doctors from Benghazi among sample of 100 statement distributed through them, 23 doctors from El-beida among 30 sample, 13 doctors from Tobrak from 30 sample, 7 from Almarage, 5 from Ajdebia and 12 from Durna among 30 sample of statement for each. The study also include 28 pharmacists collected out of 50 and 91 parents from 100 sample

Source of Data

Data was collected by KAP questionnaire prepared by researchers where the studying groups (pediatrics doctors, pharmacists and parents). It asked about their knowledge, attitude and practice of antibiotic use and misuse. Participants were given the option could read and answer the survey on their own. Questions were mainly used to assess 3 major categories, knowledge related to purpose of antibiotic, use of antibiotic, side effect of antibiotic, attitude toward consumption of antibiotic like the need to use of antibiotic, frequency of antibiotic used and practice of antibiotic use like completing the course of antibiotic and self-medication.

Statistical Analysis

The total KAP scores were calculated by summing up the Likert scale responses for each category (after reversing the scores for those that required either yes or no as the most appropriate answer). The data were interoperated in Tables and Figures, the numerical data were shown as number and percentage. To find the significant difference between the observed variable studied, Chi-Square test, unpaired t test were used, P value was taken as level of significance at <0.05. Statistical analysis was carried out in Minitab software (version17).

RESULTS

The study was included 234 participants out of 400 giving a response rate of 58.5%. A total number of them was pediatric doctors 115 (49.4%), pharmacists 28 (11.97%), and parents 91 (38.9%) (Figure-1). According to the practice of doctors regarding most commonly antibiotics prescribed. Augmentin most commonly used (51.30%) followed by Azithromycin (13.91%), Amoxicillin (11.30%), third generation (6.957%), (4.35%) for each ampicillin, no preferences to any antibiotic and only (7.83%) prescribe antibiotic according to the condition of the patients (Figure-2).

According to the doctors practice, (80.87%) they do not prescribe antibiotic for any admission while 22 (19.13%) they prescribed ($p=0.00$) and 68 (59.13%) they do not prescribe antibiotic until specialist consulting while 47 (40.87%) do not wait for the specialist treatment ($p=0.005$) (Table-1). Nineteen doctors (16.52%) they recommend an antibiotic therapy over the phone and 96 (83.48%) they do not recommend antibiotic by the phone which statistically significant ($p=0.00$) (Table-1). Of the total 33 (27.70%) they were complete the iv course of antibiotic outside hospital while 82 (71.3%) they complete iv course of an antibiotic inside the hospital which statistically significant ($P=0.00$) (Table-1). Ninety seven doctors (84.35%) were investigated before antibiotic description which reveals significantly higher than doctors they do not perform investigation before antibiotic use 18 (15.65%) ($P=0.00$) (Table-1). Regarding use of single antibiotic 96 (83.47%) they prefer to use single antibiotic while only 16 (16.52%) they prescribe multiple antibiotics which is statistically significant ($P=0.00$) (Table-1).

According to practice of the doctors 53 (46.09%) they were choose antibiotics according to the availability, 35 (30.4%) of them choose by microbial culture and sensitivity while 14 (12.17%) by the less side effect of antibiotic. Beside 8 (6.96%) were chooses by hazardous and 5 (4.35%) of them choose of antibiotic by less cost (Figure3).

In term of positive attitude of the doctors they were not routinely prescribe an antibiotic, do not prescribe antibiotic once the patient insist, do not prescribing antibiotic immediately once child had fever and others consult their specialist before use antibiotic ($P(0.00), (0.001), (0.003)$ and (0.00) respectively (Table 2).

According to the knowledge (108) (93.91%) they awarded about antibiotic resistant compare to (7) (6.09%) who do not aware about antibiotic resistant. (94) (81.74%) of them were followed guideline for antibiotic prescription with statistically significant (Table 3). Sixty four (55.65%) of the doctors was awarded about current guideline for an antibiotic prophylaxis compare to (51) (44.35%) of them do not

aware with statistically significant $P(0.006)$ (Table 3). In term to the knowledge of the doctors (103)(89.57%) was agreed about antibiotic misuse which significantly higher than these not having knowledge of antibiotic misuse $p(0.00)$ and the reasons of the misuse through to their opinion (79)(68.70%) use without investigate type of bacteria, incorrect dose, no education (79)(68.70%),(21)(18.26%) and (15)(13.04%) respectively which was significant $p(0.00)$ (Table 3). According to the doctors knowledge about side effect of misuse of antibiotic were 86 (74.78%) declared that will increase incidence of resistant while 29(25.28%) explained that will lead to presence of new type of bacteria (Figure4). Out of the total (27) participant they knowledgeable about antibiotic resistant as health problem $P(0.00)$. (Table4). Regarding the practice of the participants (8)(28.57%) of them was sold antibiotic according to the patient desire while (20)(71.43 %) participants they do not sold on the patient request $P(0.00)$ (Table 4) .Of the total participants (21) (75 %) were gave adequate information about the antibiotic to the patient which significantly higher than those do not $P(0.00)$ (Table4). According to the pharmacists opinion responsible about misuse of antibiotic were doctors (9.1%), pharmacists (1.2 %), patients (89.9) (Figure-5).

Out of the (91) parents who were asked to fill the questionnaire (53)(58.24%) was knew about the term antibiotic resistant , only(20)(21.89%) of the respondents felt un happy if the doctor not prescribe antibiotic $P(0.00)$ for each. Concerning the reason of use of antibiotic, majority (48)(52.71%) of the parents was gave it to the child for fever, followed next by flu symptoms and ear inflammation (33) (36.263%) and (10)(10.99 %) for diarrhea. The parents were thought that most common cold and gastroenteritis were treated with use of an antibiotic (52)(57.14%) respectively. Forty nine (53.85%) of the parents was said that their child received antibiotic from previous prescription $P(0.007)$, (75)(82.42%)of the parents were complete course of antibiotic prescribed by the doctors and (32)(35.16%) of them asked their doctors to prescribe antibiotic. (57) (62.24%) of them were used antibiotic because pharmacists recommendation $P(0.00)$. Fifty one (56.04 %) of the parents was declared that more confident in the doctor who prescribe antibiotic, 73 (80.22%) respond that their children get better faster when used antibiotic with statistically significant (Table-5).

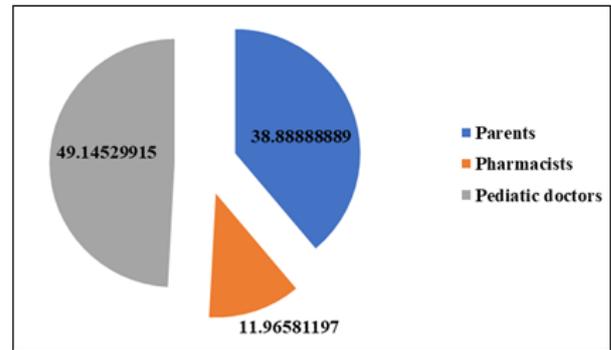


Fig-1: Distribution of the studied sample (%)

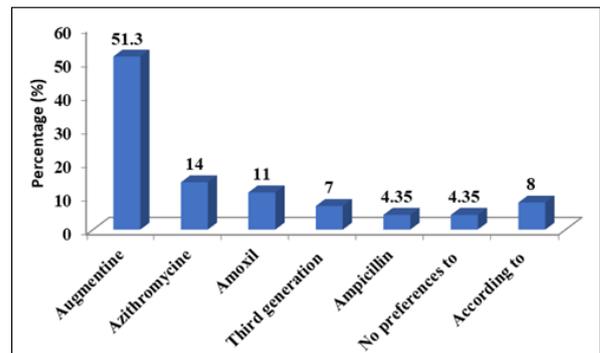


Fig-2: Percentage of different antibiotic used by the pediatricians doctors

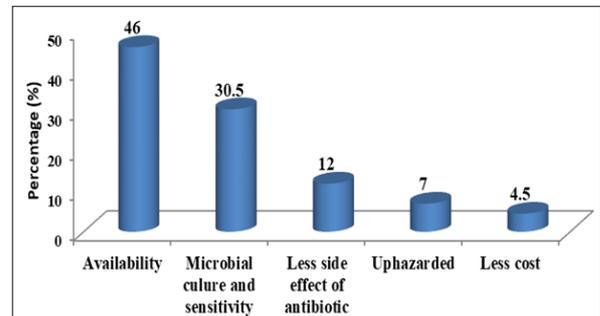


Fig-3: Percentage distribution of antibiotic that choice by the pediatricians doctors

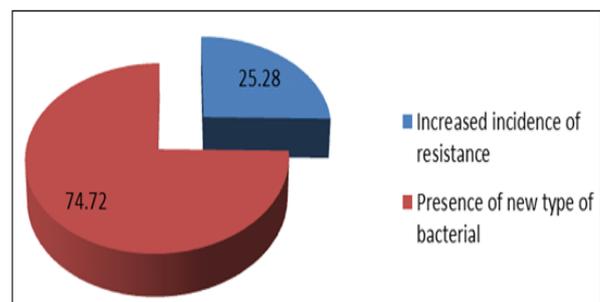


Fig-4: Percentage knowledge of doctors about influence of antibiotic misuse

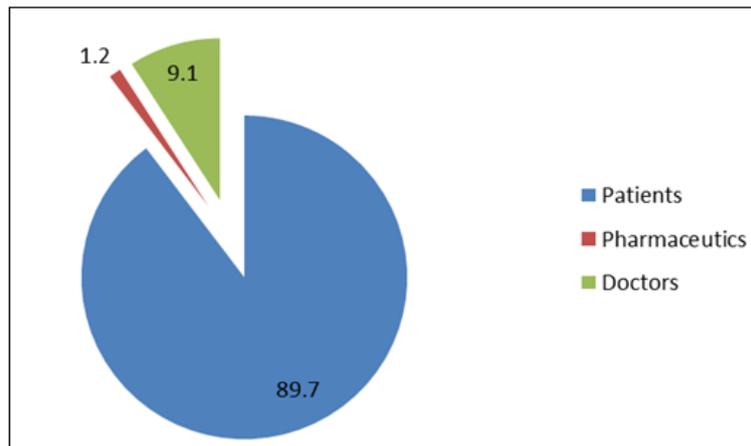


Fig-5: Demonstrate opinion of pharmacists regarding responsibility for antibiotics misuse

Table-1: Distribution of practice of pediatric doctors from east of Libya among antibiotic misuse

Statement	Number	Percentage	Pearson chi-square p-value
Do you prescribed antibiotic for any admission •Yes •No	22 93	19.13 80.87	0.00
Do you prescribe antibiotic to sustain the patient until specialist treated the patient •Yes •No	47 68	40.87 59.13	0.005
Do you recommend an antibiotic thereby over the phone •Yes •No	19 96	16.52 83.48	0.00
Do you use an antibiotic in out hospital sometimes even as complete that course out •Yes •No	33 82	28.70 71.3	0.00
Do you perform initial investigation before description antibiotic •Yes •No	97 18	84.35 15.65	0.00
Do you prefer to use one antibiotic •Yes •No	96 16	83.47 16.52	0.00

Table-2: Distribution of pediatric doctors regarding their attitude toward antibiotic use

Statement	Number	Percentage (%)	Chi-square	P-value
Do you routinely prescribe an antibiotic •Yes •No	14 101	12.17 87.83	85.186	0.00
Do you prescribe antibiotic when patients insist to that Yes •No	25 90	21.74 78.26	120.425	0.01
Antibiotic should demonstrate with once child has fever •Yes •No	10 105	8.70 91.3	67.951	0.03
Do you consult another doctor when you use antibiotic •Yes •No	81 34	70.43 29.57	139.641	0.00

Table-3: Demonstrate the knowledge of pediatric doctors regarding antibiotic use

Statement	Number	Percentage(%)	Chi-square	p-value
Are you aware antibiotic resistance •Yes •No	108 7	93.91 6.09		0.00
Do you aware guideline for antibiotic prescription •Yes •No	94 21	81.74 18.26	109.325	0.00
Are you aware about current gridline for an antibiotic prophylaxis and do you follow the same •Yes •No	64 51	55.65 44.35	157.951	0.06
Is there misuse of antibiotics •Yes •No	103 12	89.57 10.43	76.942	0.00
What are reasons for misuse of antibiotic through your opinion •Use without investigate type of bacteria •Incorrect dose •No education	79 21 15	68.70 18.26 13.04	191.850	0.00

Table-4: Distribution of knowledge, attitude, practice of pharmacists among antibiotic misuse

Statement	Number	Percentage %	Chi- square	P value
Do you think that antibiotic resistance be a health problem •Yes •No	27 1	96.43 3.57	8.628	0.00
If you have a patient who wants an antibiotic, should you sell it to him ? •Yes •No	8 20	28.57 71.43	33.503	0.00
Do you give adequate information about the antibiotic to the patient? •Yes •No	21 7	75 25	31.491	0.00

Table-5: Demonstrate response to varies statement

Statement	Number	Percentage (%)	Chi - square	p- value
Do you knew the term antibiotic resistantant • Yes • No	53 38	58.24 41.76	123.669	0.00
Would you be happy if the doctor did not prescribe an antibiotic to your child ? • Yes • No	20 71	21.98 78.02	95.847	0.00
What was the commonest cause of prescription of antibiotics • Flu symptoms and ear inflammation • diarrhea • fever	33 10 48	36.263 10.99 52.75	172.520	0.00
Do you think that most colds and gastroenteritis are treated without the use of an antibiotic ? • Yes • No	39 52	42.86 57.14	124.289	0.00

Have you used same antibiotics from previous prescription for the child if who suffer from same symptoms • Yes • No	42 49	46.15 53.85	124.054	0.07
Do you complete the course of antibiotics as prescribed by the doctor • Yes • No	75 16	82.42 17.58	84.630	0.00
Do you sometimes ask the doctor to prescribe an antibiotic to your child • Yes • No	32 59	35.16 64.83	118.020	0.00
Do you go directly to the pharmacist to prescribe an antibiotic ? • Yes • No	34 57	37.36 62.64	120.276	0.00
Do you have more confidence in the doctor who prescribe an antibiotic ? • Yes • No	51 40	56.04 43.96	124.820	0.001

DISCUSSION

The present study was described the results from a KAP-survey among 115 pediatrics doctors, 28 pharmacist and 91 parents who practiced from East of Libya. Overall, the theoretical knowledge of antibiotic use and misuse use (AMS) for doctors and pharmacist about antimicrobial knowledge including indications, administration and side effects ranged from very good to excellent. However in contrast, AMR was much less recognized as a problem in participants parents (41.76%). On the other hand, qualitative research among general practitioners in the U.S. showed that most of the physicians interviewed were aware that inappropriate use of antimicrobial in their own practice contributes to increasing AMR [18]. The present study was also showed that 37.36 % of the whole sample was found to be using un-prescribe antibiotics, which is lower than southern Spain study 41% conducted on 2006 [19]. Different factors had an influence on this behavior as age, socioeconomic level and drug availability. Inappropriate and excessive use of antibiotics are among the key factors for the increase and spread of resistance [19-21]. According to this study, the most frequent clinical indication for which antibiotics were prescribed were prescribed for symptoms or diagnoses associated with the respiratory system and gastroenteritis which similar to study done in Jordan. 2010 [22]. However, in another study on assessment of antibiotic use in pediatric patients put pneumonia at the bottom of the proportion of disorders for which were prescribed and gastroenteritis the most commonly occurred disorder [23]. Similar study conducted by Finkelstein reported that otitis media accounted for the majority of antibiotic courses dispensed [24]. This discrepancy might be due to the difference in the time period during which these study was conducted as there is seasonal variation regarding the prevalence of some diseases. Antibiotics are the

most commonly prescribed drugs in hospitals and in developed countries around 30% of the hospitalized patients were treated with these drugs [23]. In this study according to the doctors practice was showed that Augmentin was the most frequently prescribed antibiotic (51.3%). Ceftriaxone less prescribed antibiotic 7%. The difference might be due to the fact that in this similar study antibiotic selection was based on the sensitivity of the responsible pathogens unlike in our case which was empiric. In addition to this, the difference in the indications between the present study and this similar study for which antibiotics prescribed may matter. This seems reasonable as fever is the most common finding as the sign of infection during presentation to hospital and other respiratory disorders which common in children.

The present finding that about two-thirds (56.04) of participants stated their trust in doctors who were not prescribed antibiotics should be utilized in designing effective interventions to reduce patients' expectations from antibiotics and to increase knowledge about antibiotic resistance. Previously study was reported that patients satisfied with improved understanding of their diseases even if an antibiotic was not prescribed [25, 26]. In the current study, 17.58% being did not complete prescribe an antibiotic as prescribed; most of them stopped treatment because they felt better. This misconception in the antibiotic use may put the patient at risk of relapse with resistant pathogenic bacteria. It is widely believed that inadequate dosing, incomplete courses, and indiscriminate drug use have contributed to the emergence and spread of antibiotics resistance [16, 27, 28].

The current finding was showed 37.36% of the study population had self-medicated which is

considerably lower than that reported from other countries in the Middle East region that ranged between 53.6% and 96.7% [29-31]. Self-medication is a very important behavioral aspect that contributes to the misuse of antibiotics [12].

The reasons of antibiotic misuse in the present study according to the opinion of participant doctors were an empirical use, incorrect dose and low level of education 68.70%, 18.26%, 13.04% respectively; and the responsibility about antibiotic misuse according to pharmacist opinion were refer to parents and doctors 10.71%, 89.29% respectively. As regarding to the littérateur, the reasons of antibiotic misuse are complex, and several contributing factors are evidently associated with the overuse of antibiotics in both the patient's (or parents of children) level and doctor's level. These factors include cultural factors, behavioral characteristics, socioeconomic status, and level of education [32]. Furthermore, doctors usually relate their pattern of over prescribing to patients'/parents' pressure [11]. Also, lack of health education is one of the major contributing factors in the overuse of antibiotics [12]. Lack of knowledge, inappropriate beliefs and practices are vulnerable for misusing antibiotics in children [32, 33].

The World Health Organization identified three key issues for public involvement: improving access to medical facilities, decreasing unnecessary use of antimicrobials. The WHO also urged member countries to initiate educational interventions for patients and the general population aimed at rationalizing the use of antibiotics to combat resistance [16]. Thus, the control of antibiotic utilization needs multifaceted interventions involving knowledgeable and engaged healthcare practitioners and the public.

CONCLUSION

The present KAP-survey has generated information about the prescribing attitudes and practices of medical doctors and pharmacies and parents from public hospitals. The parent had lower formal education but they were aware of the risks associated with use of excessive antibiotics. More interaction with pediatricians and involvement of mass media can help to improve the antibiotics knowledge and practices among and thus, control the problem of antibiotic resistance. Stringent laws need to be enforced by the government to restrict the access of antibiotics to parents without a prescription. Revision and dissemination of local AM guidelines, addressing the general public and exploring the possibilities of internet-based trainings.

REFERENCES

- Hoffman, J. M., Shah, N. D., Vermeulen, L. C., Schumock, G. T., Grim, P., Hunkler, R. J., & Hontz, K. M. (2007). Projecting future drug

expenditures—2007. *American journal of health-system pharmacy*, 64(3), 298-314.

- John Jr, J. F., & Fishman, N. O. (1997). Programmatic role of the infectious diseases physician in controlling antimicrobial costs in the hospital. *Clinical Infectious Diseases*, 24(3), 471-485.
- Wise, R., Hart, T., Cars, O., Streulens, M., Helmuth, R., Huovinen, P., & Sprenger, M. (1998). Antimicrobial resistance. *British Medical Journal Publishing Group*, 609-610.
- Fahey, T., Stocks, N., & Thomas, T. (1998). Systematic review of the treatment of upper respiratory tract infection. *Archives of disease in childhood*, 79(3), 225-230.
- Grigoryan, L., Burgerhof, J. G., Haaijer-Ruskamp, F. M., Degener, J. E., Deschepper, R., Monnet, D. L., ... & Birkin, J. (2007). Is self-medication with antibiotics in Europe driven by prescribed use?. *Journal of Antimicrobial Chemotherapy*, 59(1), 152-156.
- Kisuule, F., Wright, S., Barreto, J., & Zenilman, J. (2008). Improving antibiotic utilization among hospitalists: a pilot academic detailing project with a public health approach. *Journal of Hospital Medicine: An Official Publication of the Society of Hospital Medicine*, 3(1), 64-70.
- Jetacar. (1999). The use of antibiotics in food-producing animals: Antibiotic-resistant bacteria in animals and humans. *Joint Expert Technical Advisory Committee on Antibiotic Resistance*.
- Braun, B. L., & Fowles, J. B. (2000). Characteristics and experiences of parents and adults who want antibiotics for cold symptoms. *Archives of family Medicine*, 9(7), 589.
- Kozyrskyj, A. L., Dahl, M. E., Chateau, D. G., Mazowita, G. B., Klassen, T. P., & Law, B. J. (2004). Evidence-based prescribing of antibiotics for children: role of socioeconomic status and physician characteristics. *Cmaj*, 171(2), 139-145.
- Teng, C. L., Leong, K. C., Aljunid, S. M., & Cheah, M. (2004). Antibiotic Prescription In Upper Respiratory Tract Infections. *Asia Pacific Family Medicine*, 3.
- Pechere, J. C. (2001). Patients' interviews and misuse of antibiotics. *Clinical infectious diseases*, 33(Supplement_3), S170-S173.
- Cebotarenco, N., & Bush, P. J. (2008). Reducing antibiotics for colds and flu: a student-taught program. *Health education research*, 23(1), 146-157.
- Bi, P., Tong, S., & Parton, K. A. (2000). Family self-medication and antibiotics abuse for children and juveniles in a Chinese city. *Social science & medicine*, 50(10), 1445-1450.
- Sarahroodi, S., Arzi, A., Sawalha, A. F., & Ashtarinezhad, A. (2010). Antibiotics self-medication among southern iranian university

- students. *IJP-International Journal of Pharmacology*, 6(1), 48-52.
15. Clavenna, A., & Bonati, M. (2011). Differences in antibiotic prescribing in paediatric outpatients. *Archives of disease in childhood*, 96(6), 590-595.
 16. World Health Organization. (2001). WHO global strategy for containment of antimicrobial resistance (No. WHO/CDS/CSR/DRS/2001.2). World Health Organization.
 17. Tenover, F. C. (2006). Mechanisms of antimicrobial resistance in bacteria. *The American journal of medicine*, 119(6), S3-S10.
 18. Simpson, S. A., Wood, F., & Butler, C. C. (2007). General practitioners' perceptions of antimicrobial resistance: a qualitative study. *Journal of Antimicrobial Chemotherapy*, 59(2), 292-296.
 19. Väänänen, M. H., Pietilä, K., & Airaksinen, M. (2006). Self-medication with antibiotics—does it really happen in Europe?. *Health policy*, 77(2), 166-171.
 20. Costelloe, C., Metcalfe, C., Lovering, A., Mant, D., & Hay, A. D. (2010). Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis. *Bmj*, 340.
 21. You, J. H. S., Yau, B., Choi, K. C., Chau, C. T. S., Huang, Q. R., & Lee, S. S. (2008). Public knowledge, attitudes and behavior on antibiotic use: a telephone survey in Hong Kong. *Infection*, 36(2), 153-157.
 22. Albsoul-Younes, A., Wazaify, M., Yousef, A. M., & Tahaineh, L. (2010). Abuse and misuse of prescription and nonprescription drugs sold in community pharmacies in Jordan. *Substance use & misuse*, 45(9), 1319-1329.
 23. Leo, M., & AS, M. D. (2008). Assessment of antibiotic use in pediatric patients at a tertiary care teaching hospital. *Indian Journal of Pharmacy Practice*, 1(1).
 24. Finkelstein, J. A., Stille, C., Nordin, J., Davis, R., Raebel, M. A., Roblin, D., ... & Chan, K. A. (2003). Reduction in antibiotic use among US children, 1996–2000. *Pediatrics*, 112(3), 620-627.
 25. Hamm, R. M., Hicks, R. J., & Bembem, D. (1996). Antibiotics and respiratory infections: are patients more satisfied when expectations are met?. *Journal of Family Practice*, 43(1), 56-62.
 26. Ong, S., Nakase, J., Moran, G. J., Karras, D. J., Kuehnert, M. J., Talan, D. A., & EMERGENCY ID NET Study Group. (2007). Antibiotic use for emergency department patients with upper respiratory infections: prescribing practices, patient expectations, and patient satisfaction. *Annals of emergency medicine*, 50(3), 213-220.
 27. Aly, M., & Balkhy, H. H. (2012). The prevalence of antimicrobial resistance in clinical isolates from Gulf Corporation Council countries. *Antimicrobial resistance and infection control*, 1(1), 26.
 28. Zhang, R., Eggleston, K., Rotimi, V., & Zeckhauser, R. J. (2006). Antibiotic resistance as a global threat: evidence from China, Kuwait and the United States. *Globalization and Health*, 2(1), 6.
 29. Al-Ramahi, R. (2013). Patterns and attitudes of self-medication practices and possible role of community pharmacists in Palestine. *International journal of clinical pharmacology and therapeutics*, 51(7), 562.
 30. 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. *International journal of public health*, 59(2), 319-327.
 31. Jassim, A. M. (2010). In-home drug storage and self-medication with antimicrobial drugs in Basrah, Iraq. *Oman Medical Journal*, 25(2), 79.
 32. Alumran, A., Hurst, C., & Hou, X. Y. (2011). Antibiotics overuse in children with upper respiratory tract infections in Saudi Arabia: risk factors and potential interventions. *Clinical Medicine and Diagnostics*, 1(1), 8-16.
 33. Abobotain, A. H., Sheerah, H. A., Alotaibi, F. N., Joury, A. U., Mishiddi, R. M., Siddiqui, A. R., & Saeed, A. B. (2013). Socio-demographic determinants of antibiotic misuse in children. *Saudi Med J*, 34(8), 832-840.