

# Parents' knowledge and attitude to self-medication of children with antibiotics

Suleiman Ibrahim Sharif, Bara'ah E. M. Masalmeh, Hoda M. A. Awad, Ala Osama, Yousra A. A. Abdulmqasood, Laila M. T. Bugaighis

Department of Pharmacy Practice and Pharmacotherapeutics, College of Pharmacy, University of Sharjah, Sharjah, UAE

## Address for correspondence:

Prof. Suleiman Ibrahim Sharif,  
Department of Pharmacy Practice  
and Pharmacotherapeutics, College of  
Pharmacy, University of Sharjah, M-23  
University City, Sharjah 27272, UAE.  
E-mail: sharifsi@sharjah.ac.ae

## ABSTRACT

**Objective:** The aim of this study was to determine the prevalence of self-medication with antibiotics in children.

**Materials and Methods:** This study was based on a prevalidated questionnaire distributed to 205 families in the United Arab Emirates, during the period of January-October 2014, on self-medication of their children with antibiotics. Data were collected and analyzed using Microsoft Excel® and expressed in terms of both counts and percentages.

**Results:** The response rate was 92.7% most respondents were well educated, and with university degrees and 45 (23.7%) participants were working in the medical field or attained a medical background. The majority of children were between 1 and 12 years of age, and the family's monthly income ranged from moderate to high for most of the participants. Community pharmacy was the main source (152, 80%) of antibiotics, and the main source of information was the pharmacists, followed by doctors and medication leaflets. Reasons for self-medication with antibiotics included previous experience with symptoms (100, 52.6%), and minor illness (67, 35.3%). The majority (141, 74.2%) of participants was aware of consequences of antibiotic misuse and bacterial resistance. The most commonly utilized antibiotic for self-medication was an amoxicillin - clavulanic acid combination. Antibiotics were most commonly used without prescription for respiratory symptoms including sore throat (104, 54.7%), cold/flu (85, 44.7%), and runny nose/nasal congestion (56, 29.5%).

**Conclusion:** Antibiotics are still used for conditions which are viral in origin and parents, misconceptions about antibiotics call for organized extensive efforts to increase public awareness of the rational antibiotic use.

**Key words:** Antibiotics, children, parents, self-medication

## INTRODUCTION

Self-medication can be defined as the utilization of medications to conditions or symptoms that are self-diagnosed, in the absence of medical consultation or retrieving a formal doctor's or a physician's prescription.<sup>[1]</sup> This practice includes the use of over-the-counter, as well as prescription medications such as antibiotics and medications utilized in

chronic conditions.<sup>[2]</sup> It has also been stressed that 22-70% of parents in many American, Asian and European countries have misconceptions about the appropriate applications and efficacy of antibiotics.<sup>[3,4]</sup> Globally, self-medication with antibiotics in children is common for viral infection.<sup>[1,5-7]</sup> it is also estimated that worldwide more than 50% of antibiotics are

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obtained without a prescription, from pharmacies or other sources.<sup>[8]</sup> Earlier studies<sup>[7]</sup> stressed the need for more efforts and effective interventions to promote rational antibiotic use, particularly in the pediatric population. It is also important to stress the importance of continuous monitoring of drug use in pediatrics as part of the evaluation of risk/benefit of therapeutics in children.<sup>[9]</sup>

Self-medication with antibiotics is practiced for multiple reasons including, but not limited to, elevated costs of medical consultation, absence of the nearby hospital or clinic, influence of family members and friends, and previous experience with the symptoms and their management. The practice is also enhanced by the lack of strict regulations with respect to dispensing prescription drugs.<sup>[2]</sup>

This irrational attitude has developed into a preponderant health dilemma, because the inevitable consumption of antibiotics has led to the emergence of bacterial resistant strains especially *Streptococcus pneumonia*, which is a leading cause of most of the children's infections, like bacterial meningitis, pneumonia, and otitis media.<sup>[10]</sup> Apart from bacterial resistance, there are multiple other threatening consequences that have the potential of evolving such as; serious side effects, drug interactions, missed diagnosis of a critical patient's condition or mistreatment, prolonging treatment duration, polypharmacy, superinfection, the need for hospitalization, and increase in the overall treatment costs.<sup>[10,11]</sup>

Several factors influence patient's decision to self-treat themselves or their families with antibiotics. These include age, gender, educational level, profession, attitudes about life and health, family and friends, availability of medications, low income, and medical knowledge.<sup>[2,10,12]</sup>

To our knowledge, studies on self-medication with antibiotics in children is lacking in the United Arab Emirates. Therefore, we attempted to determine the prevalence of self-treating children with antibiotics and to identify factors associated with the nonprescription use of the drugs.

## MATERIALS AND METHODS

This anonymous questionnaire-based study was executed in the period of January-October 2014, making use of a prevalidated questionnaire consisting of both open-ended and close-ended questions. This

questionnaire was initially piloted on a sample of 8 senior married students of the university. Comments and recommendations received were considered in the final version of the questionnaire. The study was approved by the Research and Ethics Committee of the Colleges of Medicine and Health Sciences; University of Sharjah, United Arab Emirates. The questionnaire was in English and Arabic and was distributed to a total of 205 families. The aim of the study was explained to all those who received the survey and the use of antibiotics without a prescription was considered as self-medication.

The questionnaire contained questions covering demographic data such as; the educational level of the parents, their professions, the number of children, family monthly income, and questions focusing on self-medication with antibiotics. These include the participant's perception about the type of infection requiring antibiotics, the reasons behind the use of antibiotics, the source of antibiotics, the source of information about antibiotics, and when should patients commence and stop the treatment with antibiotics. The data were summarized as frequency and percentage.

## RESULTS

The questionnaire was distributed to 205 families and was completed by 190 families having a total of 289 children. The response rate was 92.7%, and as shown in Table 1, more than 50% of the surveys were filled by

**Table 1: Demographic characteristics of participants n=190**

Demographic characteristics	N (%)
Parent filling the survey	
Mother	109 (57.4)
Father	81 (42.6)
Parents' education level	
Literate	1 (0.5)
School	25 (13.2)
University	145 (76.3)
Master	14 (7.4)
PhD	5 (2.6)
Parents' profession	
Medical	45 (23.7)
Non-medical	145 (76.3)
Family monthly income (thousand dirham)	
<5	8 (4.2)
5-10	32 (16.8)
10-15	50 (26.3)
15-20	44 (23.2)
20-30	41 (21.6)
>30	15 (7.9)

mothers, the majority of participants (145, 76.3%) had a university degree and only 45 (23.7%) were working in the medical field or having a medical background. The total number of children was 289 with most of them aging between 1 and 12 years. The family's monthly income in thousand dirhams for most of the participants ranged between 5000 and 30,000, which is approximately the equivalent to \$1360–8152. Only a few participants (29, 15.3%) stated that self-medication with antibiotics is acceptable, while others (75, 39.5%) stated that it is not acceptable, and 86 (45.3%) declared that it is sometimes acceptable.

The most common reason for self-treating children with antibiotics were "previous experience with symptoms" (100, 52.6%) and "the condition is minor" (67, 35.3%). Long waiting time at clinics and the high cost of medical consultation were selected by a minority (30, 15.8%) each [Table 2]. Also shown in Table 2, the main source from which participants obtained antibiotics. The majority (152, 80%) of participants obtained antibiotics from the community pharmacy, followed by the hospital pharmacy (53, 27.9%) and leftover antibiotics (41, 21.8%). In response to the question on which types of infections is sensitive to antibiotics, participants (110, 57.9%) selected bacterial infections, while 53 (27.9%) selected bacterial and viral, 15 (7.9%) did not know and only 12 (6.3%) selected viral infections. More than two-third (141, 74.5%) of respondents were aware of consequences of antibiotic misuse, with bacterial resistance (110, 57.9%) and adverse effects (107, 56.3%) being the highest selected options.

Table 3 shows that slightly <50% of participants decided to start their children on antibiotics "after consulting a pharmacist," "when symptoms last for few days" (75, 39.5%) and "after trying other medication without improvement" (45, 23.7%). In deciding the dose to be given to the child, participants "consulted a pharmacist" (90, 47.4%), "checked the leaflet in the package" (75, 39.5%) or consulted a doctor (75, 39.5%). About 50% of participants stopped administration of antibiotic on completion of the course. Also Table 3 demonstrates that only 31 respondents admitted changing the antibiotic during the course of treatment because the former one did not work (17, 54.8%), or it was finished (8, 25.8%).

Only 20 (10.5%) of all participants indicated that their children experienced side effects, and 10 (50%) consulted a doctor, 8 (40%) stopped administering the antibiotic, 4 (20%) continued the antibiotic, 2 (10%)

**Table 2: Reasons for children self-medication with antibiotics, source of medication and awareness and consequences of antibiotic misuse**

Variable	N (%)
Reasons for self-medicating children with antibiotics	
Previous experience with symptoms	100 (52.6)
Minor illness	67 (35.3)
Long waiting time at clinics	30 (15.8)
High cost of medical consultation	30 (15.8)
Knowledge as a healthcare professional	25 (13.2)
Other	12 (6.3)
Source of antibiotic	
Community pharmacy	152 (80)
Hospital pharmacy	53 (27.9)
Left over	41 (21.8)
Friend/relative/neighbor	8 (4.2)
Are you aware of consequences of antibiotic misuse?	
Yes	141 (74.2)
No	49 (25.8)
Consequences of antibiotic misuse	
Bacterial resistance	110 (57.9)
Adverse effects	107 (56.3)
Prolonging the treatment duration	26 (13.7)
Need for hospitalization	19 (10.1)
Increased treatment cost	16 (8.4)

consulted a pharmacist, and 1 (5%) changed the antibiotic with another.

As shown in Figure 1 amoxicillin + clavulanic acid was the most commonly (93, 48.9%) used antibiotic followed by amoxicillin (81, 42.6%), and metronidazole (39, 20.5%). On the other hand, conditions for which antibiotics were used by participants without prescriptions are shown in Figure 2. The most common conditions treated with antibiotics include sore throat (104, 54.7%), cold/flu (85, 44.7%), runny nose/nasal congestion (56, 29.5%), and fever (40, 21.1%).

## DISCUSSION

In the United Arab Emirates the health regulatory bylaws are very strict against dispensing prescription drugs including antibiotics without a prescription. However, our results clearly show that the self-medication of children with antibiotics without proper consultation is a common practice in the community. Most participants obtained antibiotics from community pharmacies and consulted pharmacists for information regarding antibiotics and their dosages. This finding is similar to the results reported in Saudi Arabia,<sup>[13]</sup> Lithuania,<sup>[14]</sup> Trinidad and Tobago,<sup>[5]</sup> China,<sup>[1]</sup> and Mongolia.<sup>[6]</sup> Such a trend of liberal dispensing of antibiotics by pharmacists,

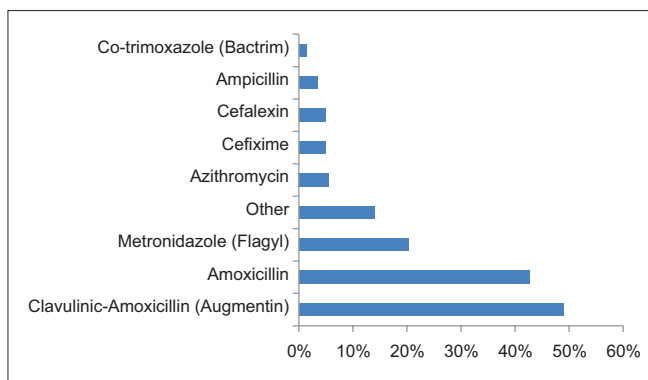


Figure 1: Most frequently utilized antibiotics for self-medication in children

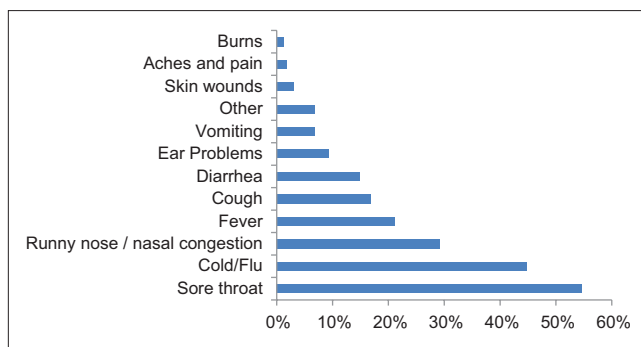


Figure 2: Conditions for which participant parents self-medicated children with antibiotics

**Table 3: The decisions of participants to treat their children with antibiotic, select the dose, stop the antibiotic and change it during the course of treatment**

Action taken	N (%)
When you decided to start the child on antibiotic?	
After consulting a pharmacist	89 (46.8)
When symptoms last for few days	75 (39.5)
After trying other medications without improvement	45 (23.70)
As soon as symptoms appear	21 (11.1)
After consulting family member/friend	12 (6.3)
How you decided on the dose of the antibiotic?	
After consulting a pharmacist	90 (47.4)
After checking the leaflet	75 (39.5)
After consulting a doctor	75 (39.5)
Relying on my own previous experience	34 (17.9)
After consulting family member/friend	24 (12.6)
Checking the internet	5 (2.6)
When did you stop administration of the antibiotic?	
On completion of the course	94 (49.5)
After symptoms disappeared	30 (15.8)
After finishing the medication	30 (15.8)
After 3-5 days regardless of the outcome	21 (11.1)
A few days after recovery	17 (9)
After consulting a doctor	17 (9)
After consulting a pharmacist	13 (6.8)
Why did you change the antibiotic during course of treatment?	
The former antibiotic did not work	17 (54.8)
The former antibiotic was finished	8 (25.8)
To reduce the adverse effect of the former antibiotic	7 (22.6)

which is against the United Arab Emirates regulatory bylaws, must be discouraged and strictly controlled. The results also point to the urgent need for more focused efforts to increase the awareness of not only the public but also that of practicing pharmacists of rational use of antibiotics. More emphasis on these issues can be made for pharmacy students through their undergraduate curriculum and also continuing

pharmaceutical education programs for practicing pharmacists. This is of paramount importance since pharmacists as frontline healthcare providers should advocate the rational use of drugs and should closely adhere to the policies and regulatory bylaws of the health authorities in the country with regard to dispensing prescription drugs including antibiotics.

Most of the questionnaires in the present investigation were filled by the mothers. It is usual that mothers take the lead in caring for the health of her children. The majority of respondents were university graduates with about 25% of them either working in the medical field or having a medical background. The latter did not seem to positively influence the practice of self-treating children with antibiotics.

With regard to family monthly income slightly <50% of participants received a monthly salary in the range of <5000–15,000 AD (the equivalent of <1359–4167\$). In the light of the high cost of clinic visits and lack of inclusive medical insurance, the low economic status of parents would certainly forces parents to self-medicate their children.

Our results show that more than 50% of participants selected bacterial infections as the main indication for antibiotic use, and only small number of participants find self-medication with antibiotics acceptable. Moreover, the awareness of bacterial resistance and knowledge of the consequences of antibiotic misuse among participants may seem reassuring but the high prevalence of the practice of self-medication of children with antibiotics seems inappropriate. It has earlier been stressed that based on their previous experience,<sup>[6,15]</sup> parents consider themselves of adequate knowledge about antibiotic use. Our findings support those of previous studies in Mongolia<sup>[6]</sup> and the USA,<sup>[15]</sup> as most respondents in our study suggested past experience as the main reason for medicating their children with antibiotics but contrast with reports in

Ethiopia<sup>[16]</sup> and India<sup>[17]</sup> where high cost of clinic visits was the main reason. In the later countries, the economic status of parents would certainly justify this reason as the main motive for the use of nonprescribed antibiotics. In this study, high cost of medical consultation was selected by only a minority (15.8%) of participants. Other reasons for self-medication with antibiotics were a minor illness, and long waiting time at clinics. These results recall those of the studies conducted in Europe<sup>[18]</sup> and in Saudi Arabia<sup>[13]</sup> where minor illnesses and long waiting time at clinics were the main reasons for self-medication with antibiotics. Regardless of its prevalence rate, the practice of medicating children with nonprescribed antibiotics that is based on the past experience carries the risk of misdiagnosis and mistreatment and should be discouraged.

In accordance with the results of studies in pediatrics in Umm Al Qwain<sup>[7]</sup> and in adult population in Abu Dhabi<sup>[19]</sup> and Yemen,<sup>[20]</sup> the most commonly used antibiotics for self-medication in children were amoxicillin - clavulanic acid combination, amoxicillin, and metronidazole. The present results also show that antibiotics were mostly made use of without prescriptions for indications of respiratory symptoms including a sore throat, runny nose, and nasal congestion. Such a trend resemble that reported in Europe,<sup>[18]</sup> Abu Dhabi,<sup>[19]</sup> Yemen,<sup>[20]</sup> and Umm Al Qwain<sup>[7]</sup> where bronchitis, upper respiratory tract symptoms, and influenza were the most common conditions for which antibiotics were used. It has been repeatedly stressed that the majority of these conditions are usually viral and do not require the use of antibiotics.<sup>[1,5,7,18]</sup> Taken together, results of all these studies may indicate a common pattern of misuse of antibiotics both in children and adults.

Only a few (31, 16.3%) of participants in our study changed the antibiotic during the course of treatment. Such a trend was based on the lack of perceived efficacy from the earlier antibiotic, the former one ran out, or as a result of the occurrence of side effects/adverse reactions. This behavior should also be discouraged as it contributes to the emergence of resistant microorganisms. With respect to the few participants who reported that their child suffered from side effects including skin rash, allergy, vomiting, and diarrhea, the parents mainly dealt with it by consulting a doctor or interrupting the antibiotic administration. That is an acceptable and encouraged practice to avoid any further complications.

## CONCLUSION

Self-medication of children with antibiotics is a common practice. The majority of parents were aware

of the deleterious consequences of the antibiotic misuse and its threat of imposing bacterial resistance, as well as the risk of side effects. However, their attitude in dealing with self-use of antibiotics in their children seems inappropriate. Pharmacists as drug experts and frontline providers of healthcare must actively participate in efforts directed to increasing their own knowledge and enhancing public awareness of the rational drug use. Moreover, health authorities adopt a national day for antibiotics were well-organized efforts are directed to increasing public awareness of the responsible use of these medications.

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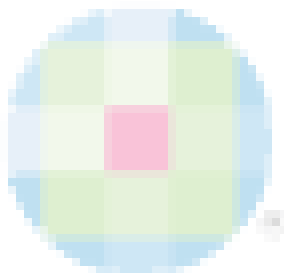
## Conflicts of interest

There are no conflicts of interest.

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