International Journal of
Health Systems and Medical Science

ISSN: 2833-7433
Volume 2 | No 5 | May - 2023

Antibiotics: The Most Frequent Misused Medications Items Amongst Children Below Five Years of Age in Samaraa General Hospital

Hassan Khuder Rajab[1], Amal Al-Hamami[2], Nuha M Salih Al-Zaubai[3]

[1] Department of Pharmacology, College of Medicine, Tikrit university, Tikrit, Iraq
[2] Department of Pediatric, College of Medicine, Al-Iraqia university, Baghdad, Iraq
[3] Department of Pharmacology, College of Medicine, university of kerala, Iraq
Hassan1969tob@tu.edu.iq

Abstract: Introduction: Antibiotics are medicines used to treat bacterial infections—however, their overuse or misuse results in resistance to antimicrobial agents. Resistance is defined as antibiotics' failure to treat the microbes at the same dose and interval. Antibiotic resistance is a global phenomenon, especially in children. There were about 200,000 newborns death resulting from an infection that was caused by multi-drug resistance bacteria, according to the World Health Organisation (WHO).

Purpose: This study highlights the rationale for the inappropriate usage of unnecessary drugs and antibiotics with their limitation and harmful effects on children under five years.

Materials and Methods: This observational cross-sectional study was conducted on 180 children randomly selected in the pediatrics department of Samarra general hospital in Samarra City. They were given a designed, previously validated questionnaire. This study was carried out from 9th March 2020 until 22nd May 2020. Inferential and descriptive statistics were employed to analyze the data.

Results: One hundred eighty parents participated in the current study (47.2 males and 52.7% female, mean age). During the study time, respondents had taken their children to physicians, and antibiotics were prescribed in about 57.22%. Of these, only 79%reported using over-the-counter medications, with antibiotics being the most prevalent drug in 66% of cases. Seventy-one percent of parents insisted on prescribing antibiotics, with pediatricians being the most in charge (59%) with antibiotics prescriptions. In most cases, antibiotics were used in treating viral infections (62%0), whereas they were used less frequently to treat bacterial infections. The current results revealed a significant gap in knowledge regarding antibiotic use among parents ($P < 0.05$).

Conclusion: The current results revealed poor knowledge of medication use among children, especially antibiotics. These results necessitate educating parents on antibiotic use and applying strict guidelines on prescribing antibiotics. Doctors and licensed health professionals are the sole authority to prescribe antibiotics only if needed to avoid antibiotic resistance. Antibiotics should only be used following WHO guidelines on the safe usage of antimicrobials. Accurate diagnosis, underlying etiology, infection's site and the severity, pharmacokinetics, pharmacodynamics of the used drug, adverse effects, and medication cost are crucial elements to consider for a safe antibiotic prescription.

Key words: antibiotics, children, resistance, abuse

Introduction

In children, insufficient studies exist on the safety and effectiveness of prescriptions [1]. Thus, more studies are required to evaluate the safety of the prescriptions amongst them. Only a few available clinical trials include children [2]. Off-label prescriptions include several unlicensed medications for children. Unwanted adverse reactions and side effects are common consequences of the lack of solid evidence on prescription or dose. To overcome the drawbacks of off-label prescription, the European Medicines Agency and the US Food and Drug Administration (FDA) authorized licensed companies to provide proof of the efficacy and safety of medications for children. Inappropriate use of asthma medications, antibiotics, antihistamines, and amphetamines was reported in children [3].

Prescribing indicators were used in adults to assess the medications' use in their PRESCRIPTIONs, in which pieces of evidence are utilized in assessing the prescription's quality (4); they are specific to the appropriateness of prescriptions and are disease or medicine oriented, focusing on drugs to be avoided. Developing clear prescribing indicators is restricted; however, merging the experts' opinions with consensus methods could help create a quality indicator in areas where it would be impossible [4].

Antimicrobials, dermatological and respiratory drugs were the most frequently prescribed drugs among children, and their prevalence was higher among those below the age of 5 years. The prevalence of these prescribed drugs was highest in children under five years [5]. Nearly 50% of the prescribed antibiotics given to children appeared unnecessary and inappropriate [6]. An annual estimation of six million prescriptions for antibiotics was recorded in the UK; most of these prescriptions were to treat upper respiratory infections, mostly due to viral infections [18]. Antibiotic overuse was observed in croup, otitis media, eczema, and tonsillitis, with the latter being the sole indication for prescribing antibiotics, with less than 50% of adherence in Australia [1].

Increased antibiotic resistance was associated with unnecessary prescriptions and inappropriate use of them. It has been found that prescribing antibiotics to treat urinary and respiratory infections resulted in developing resistance to the prescribed antibiotics, which lasted for an annum, as per the systematic review and meta-analysis, which included 11 studies on children [7].

A significant decrease in antibiotic use (93.9%) in children and adolescents was observed in the USA between 199-2002 and 2011- 2014, and the biggest improvement was in children below the age of five years [8].

Antimicrobial resistance (AMR) is an emerging health concern globally. Therefore, experts necessitate urgent intervention. The overuse and misuse of antibiotics are the major contributors to the emergence of resistant bacteria. Parental knowledge, beliefs, and attitudes are essential to consider when children's antibiotic use change is needed [9]. Many studies measure parents' knowledge, beliefs, and attitudes toward antibiotic usage. However, systematic reviews are required to provide an overview of the research type.

The current study aimed to evaluate the misuse of medication in children under 5 years old and its consequences.

Material and methods

This observational cross-sectional study was conducted at the Department of Pediatrics-Samarra General Hospital/ Samarra City from 9th March 2020 until 22nd May 2020. A total of 180 participants from Samarra City and the neighboring areas (males and females) with an age range of newborns- to preschool children who attended the pediatrics department were included in this study.

Sampling method: The study used a randomized sample from Samarra General Hospital.

Data collection: Special questionnaire designed to contain the variable (name, gender, age, address, main complaint, reason for taking drug versus the patient condition, relative knowledge). The questionnaire was distributed among three medical providers equally (60 copies for each) to collect data from the patient's relative.

Data analysis performed using Microsoft Excel to create tables, graphs present research findings.

Ethical consideration: The World Medical Association Declaration of Helsinki statement (World Medical Association, 2013) was followed. The Research Ethical Committee at Tikrit University, College of Medicine, approved the study protocol. Verbal consent was obtained from the legal representative of each participant. Their participation in the study was considered upon completing the questionnaires.

Results

Demographic distribution of the participants

The current results showed that 101 out of total were living in the city, distributed as 50 male and 50 females, and the remaining (79 child, 35 male and 44 female) are living in rural area as shown in Figure 1.

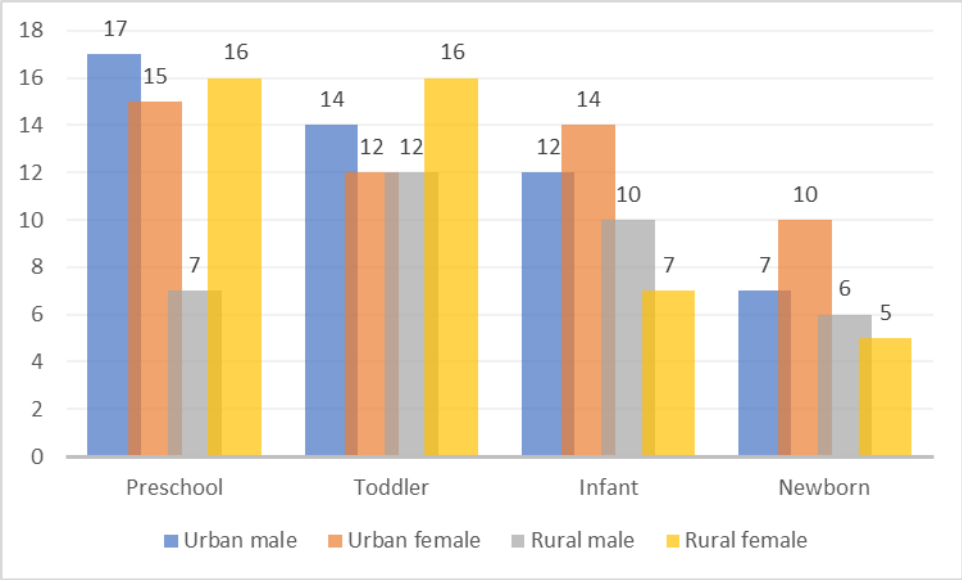

Figure.1 Shows the demographic distribution of the children who participated in this study.

Attitude, knowledge toward using Over the Counter Medication.

The current results revealed that parents mostly used OTC medications as they meet their needs, and they are easy to get. Seventy- nine percent of the participants, Figure 2, buy OTC to treat different illnesses. They usually seek the pharmacy advice when available.

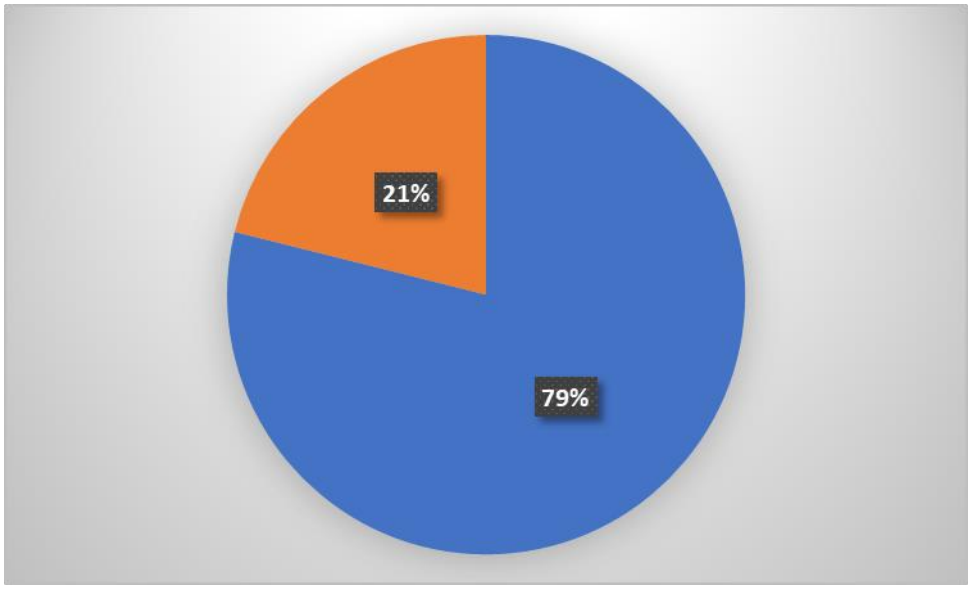

Figure 2: Shows the attitude of parents toward using the over-the-counter medications.

In this study, antibiotics constitute the most used OTC medication (66%), Figure 3. However, this percentage seems comparable to prescriptions, where antibiotics constitute about 57.22% of the total, Figure 4. Antibiotics were used for fever, to treat dermatological conditions, diarrhea, headache, and Genito urinary tract infections, as shown in Figure 5.

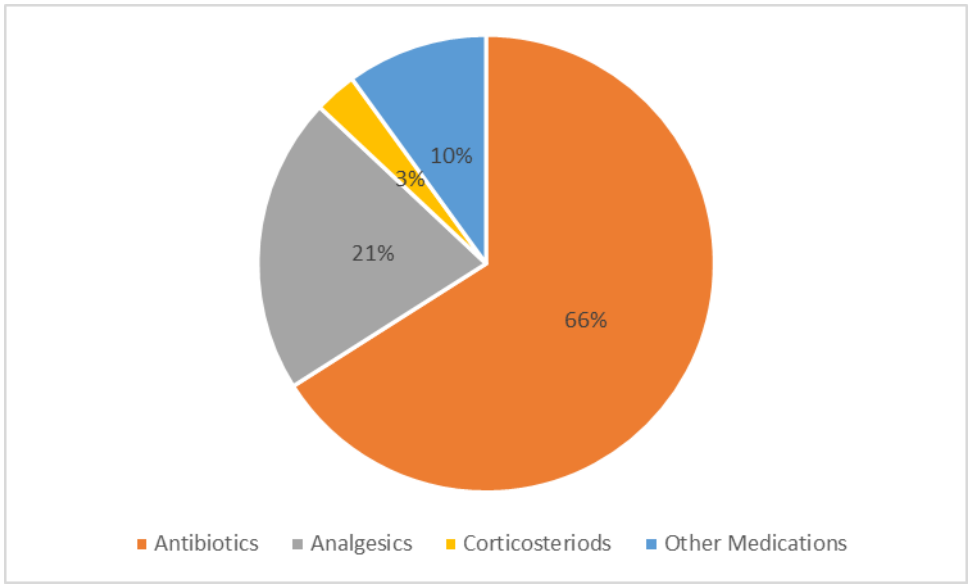

Figure.3 Shows percentage of the most used Over-the-Counter medications.

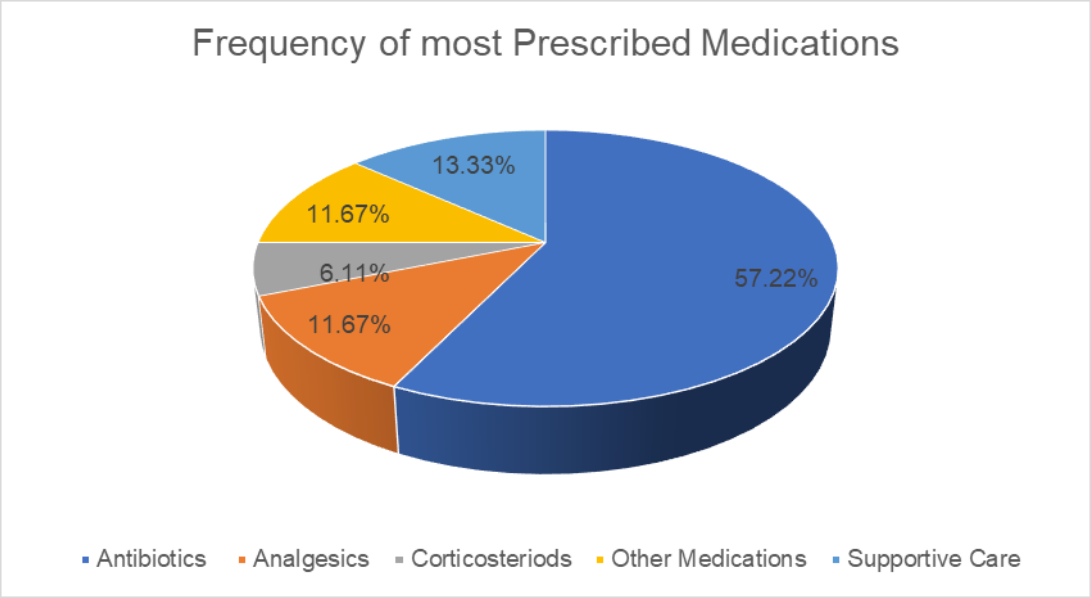

Figure.4 Shows the frequency of the most prescribed medication. It shows that antibiotics was the most prescribed medication.

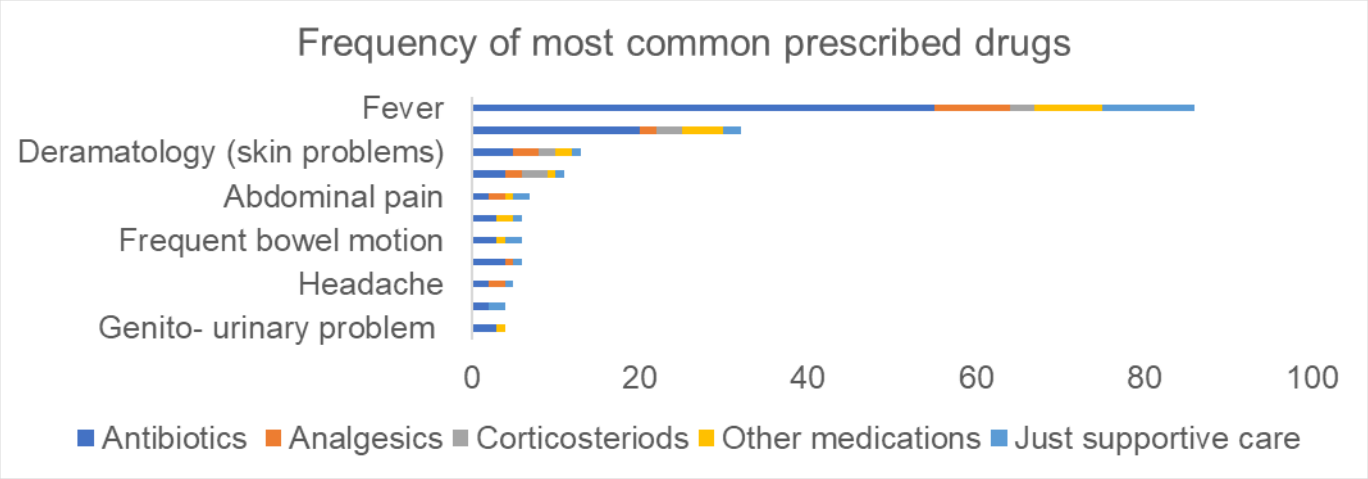

Figure.5 Shows the frequency of the prescribed medication that used to treat different conditions.

Knowledge of parents about antibiotics usage

In the current study, 71% of the participants insisted on prescribing antibiotics, as shown in Figure 6. The results also revealed that pediatricians were the most in charge individuals, with 59%, followed by pharmacists, and other health professionals, including nurses, with the least reported for unlicensed individuals, as shown in Figure 7.

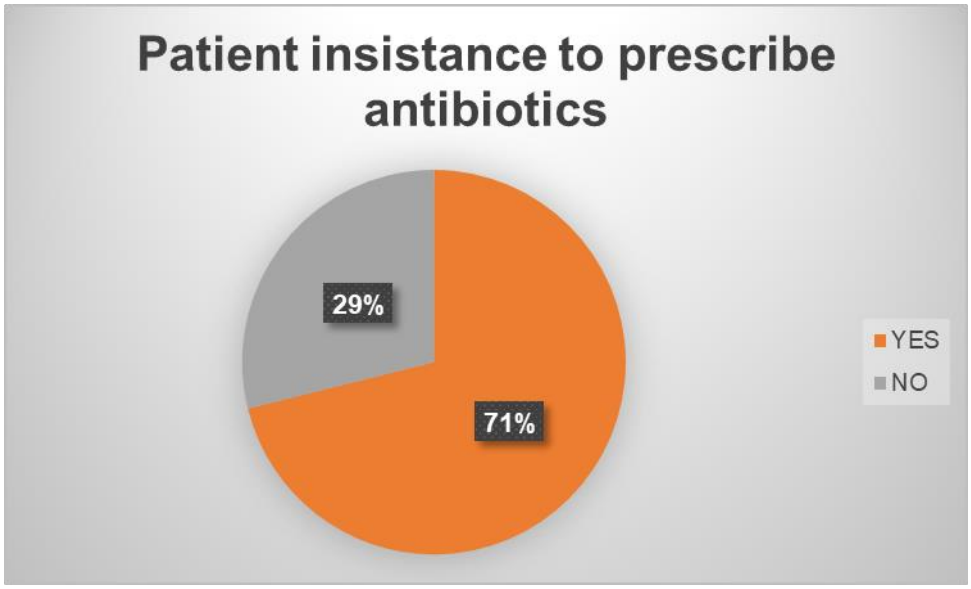

Figure 6: Shows the percentage of insistence on prescribing antibiotics

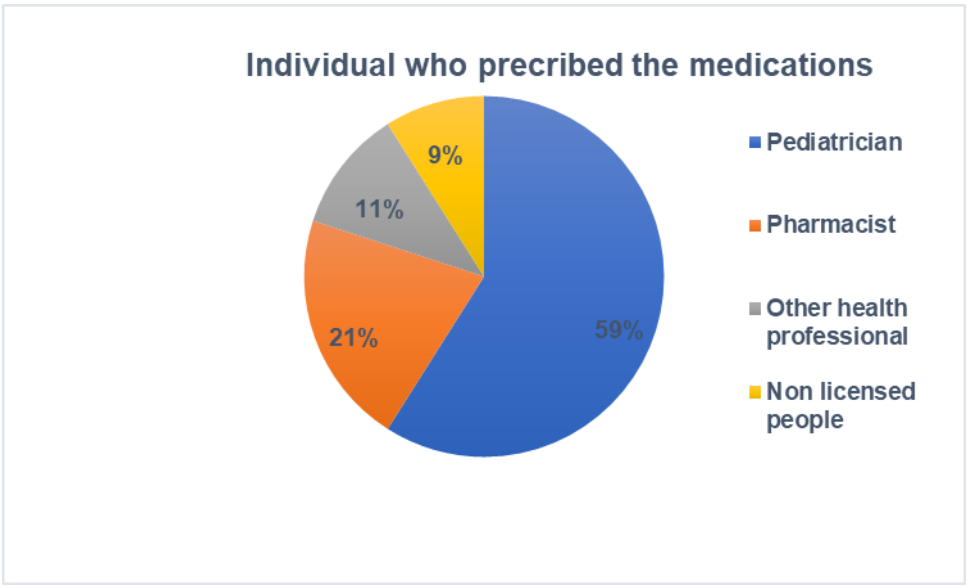

Figure.7: Shows the profession of individuals who in charged in prescribing medications.

Antibiotics were used mainly in treating viral infections compared to their use in treating bacterial ones, which are shown to be the least, as shown in Figure 8.

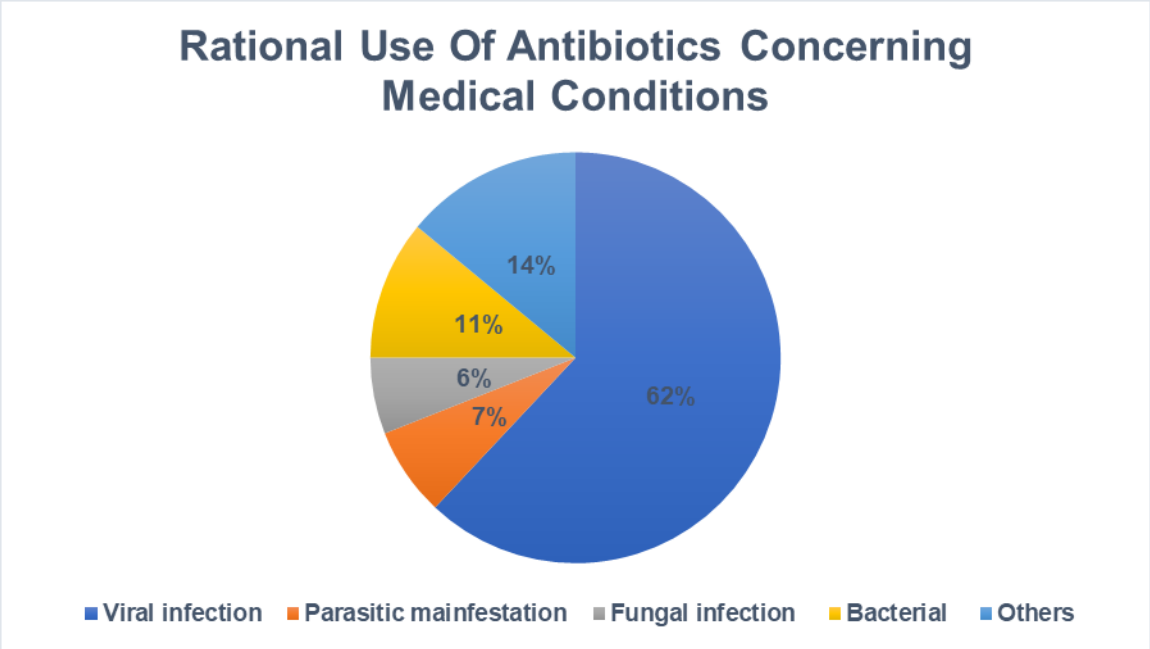

Figure.8: Shows the frequency of infections that treated with antibiotics. It shows that antibiotics were used mostly for viral infection in 62% of cases compared to bacterial infection (11%).

Discussion

The increased tendency to give non-prescription medications to children is a major health issue (10). Current results showed that most parents (79%) use OTC medications for their children to treat different illnesses, as shown in Figure 2. Parents find it easy to get OTC medications without visiting the care provider. It is also easier to get what they want, of special interest antibiotics. Parents believe antibiotics are a magic cure to combat various symptoms and infections, including viral and fungal ones (10).

The current results showed that most of the OTC used in children are antibiotics with a percent reaching 66%, but there is a slight decline (2.8%) in this percentage when it comes to the prescribed antibiotics for this age group, which still reasonably high, Figures 3 and 4. The percentage of self-administered antibiotics decreased in countries such as in Cyprus (6%), Greece (10%), Turkey (11), and the USA (18%) [12, 13,14]. However, non-prescribed antibiotic frequency use was high among young children in the urban community of Mnagolia (15). Self-administered antibiotics appeared more frequently in younger individuals from low- or middle-income groups (16).

Inadequate knowledge about antibiotics misuse was linked to self-medication and antibiotic resistance [17]. In contrast, the decrease in the likelihood of giving non-prescribed antibiotics was associated with higher knowledge. Also, high distance from the hospital and low income was associated with self-administering antibiotics (18). Yet, the current results revealed the highest percentage of non-prescribed antibiotics that have been used in children, which is frightening.

In the middle east, parents appeared to be confused about how antibiotic resistance occurs, where most of parents had never heard of antimicrobial resistance, and that antimicrobial agents might kill and eliminate the normal flora in the gut [19]. In general antibiotics resistance in children is an emerging global health problem that necessitate attention [20].

According to Ingram et al. study, parents seemed to have different attitudes and expectations regarding the prescription; some parents expect and seek to have antibiotics while others seek professional advice.[11]. About seventy percent of parents insist on prescribed drugs in the USA, whether it is Antimicrobial or other types of medication [6,21]. A similar trend was observed in Europe, where parents expected to receive antibiotics even for fever. Similar results were obtained in this study, as shown in Figure 5 and 6.

Overusing unnecessary antibiotics could emerge resistance to the antibiotic, adding to other adverse reactions, including life-threatening anaphylaxis. The overuse of antibiotics seems indifferent between the least developed and the developed countries; about 10% of U.S. children get unneeded medications [7].

Current results showed that parents think antibiotics cure different symptoms, including fever, tonsillitis, diarrhea, earache, and green nasal discharge, and believe that broad-spectrum antibiotics rapidly cure an infection, including the viral one. Fever interprets as an ominous sign, and antibiotics are thought to be effective against it; thus, parents insist on having antibiotics. In this study, antibiotics constitute the most prescribed medication, with 57.22%, Figure 4.

Knowledge about the appropriate usage of Antibiotics varies among countries. Parental awareness regarding the effectiveness of antibiotics against bacteria exceeds 55% in Europe and the USA[21]. In contrast, in the Middle East [21,17], this percentage did not exceed 20% and agreed with the current study's findings. Although parents are aware of the inappropriate and excessive use of antibiotics to treat the common cold, a minority agree that children receive many antibiotics [15, 14]. However, parents do not fully understand antimicrobial resistance [14]. According to Cabral et al., physicians might think parents' concerns are ways to force the prescription of antibiotics, resulting in unnecessary use. Thus, improving communications between the two parties could minimize the rate of unnecessary prescriptions, especially antibiotics in children [1].

The unnecessary use of antibiotics included babies, who might be at risk of developing allergies later [17]. Antibiotics kill the normal flora, opening the way to more dangerous microbes [13].

Conclusion

In children, inappropriate prescriptions yet still challenging to be identified. Therefore, adherence to the clinical guidelines is a must. The current study stressed the misuse of antibiotics in one center. Also, it stressed the gap in knowledge regarding the appropriate use of antibiotics among parents. It shows that antibiotics were the leading drug among OTC drugs. It also showed that its usage was inappropriate for treating viral infections in most cases. The pediatrician mostly contributed to prescribing antibiotics due to the parent's insistence. Thus, proper concurrent training is required for both parties (doctors and parents) to eliminate unnecessary usage of prescriptions. However, further studies are required to provide a more detailed insight into the most misused medications in children following the current results.

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