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## The logical extent of the use of antibiotics for children from the point of view of parents: Analytical study in children's departments in Baghdad

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### Abstract

**Objective:** The rational usage of drug is identified that use the appropriate medication for individual disease, only for required time and doses depended manner in cost-effective way, respectively. Antibiotics are the most common type of medication that misused according to rule of rational usage of drug. Antibiotics are used in mostly childhood. Due to the antibiotics prescription and diagnosis some diseases affect children more frequently than adults such as otitis media, tonsillitis, sinusitis.

**Material and Method:** In this research, classic and multiple choice questions were done a total of 248 parents that have at least one child who were treated in Baghdad /Al Karkh Department of Pediatrics in 2021 and 2022. SPSS 21.0 software was used for statistical analysis. Comparison of intergroup data was determined using Student's t-test and Chi square test.

**Results:** Answers were compared with overall comparison, compared with age and educational status. Given the answers due to the usage of antibiotics randomly end up with the rate of remain ineffective were founded 71, 5% (in general), 82,9% (40 aged and over), 82,2% (university degree), respectively. In questions for parents, in cases where the symptoms begin to improve, 54.8% were cut the drugs for treatments that were uneducated, 52, 3% were continue the using drugs that were graduated from university.

**Conclusion:** Health departments and the community should be informed about rational usage of antibiotics which have significant impact on health in line with the principles of rational usage of drug. Further researches should be carried on continuously to improve the rational usage of antibiotics.

**Keywords:** Rational usage of drug, antibiotics, childhood, parents

### 1. Introduction

Rational drug use (RDU) is the ability of individuals to provide the appropriate drug according to their clinical findings and individual characteristics, at the appropriate time and dose, at the most affordable cost and easily [1, 2]. Rational drug use (RDU) is given great importance in Iraq and in the world, and many health-related institutions, especially the World Health Organization (WHO), are working on this issue. The use of wrong, unnecessary, ineffective and high-cost drugs all over the world necessitates the use of AIC [1-3]. It is aimed to educate physicians, pharmacists and other health professionals about RHC and to improve their awareness levels, and training activities are carried out on this subject [5-7].

Irrational drug use; It is the use of drugs in unnecessary situations, in high doses, for a long time and with high cost [1-7]. According to the researches, antibiotics are the most common and most used drug group in the world, and more than 20 billion USD is spent annually. The widespread use of antibiotics and their cost, which is one of the basic principles adopted by the WHO and the World Bank (WB), increase its importance in RUD [7]. Although the consumption of antibiotics varies according to the country, this figure has an important place all over the world. In developed countries, which have almost all of the financial size of the pharmaceutical industry, antibiotics are in the 5th place in the consumption order, while in our country (16.3%) they are in the first place [8-11]. Antibiotics and similar drugs constitute 21% of the annual per capita drug consumption in Iraq, which is 40 dollars. This shows that the share of antibiotics in general drug costs in Iraq is approximately 2.5 times higher than the world standards. The most important of the problems caused by irrational drug use is when it comes to antibiotics.

Is the development of resistance [12, 14, 15]. The fact that the production of new antibiotics involves long processes and that bacteria can renew themselves quickly while producing new ones increases the importance of rational antibiotic use.

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The use of antibiotics is widely observed in the treatment of infectious diseases. Antibiotic use is high in infections such as pneumonia, septic patients, neutropenia, and bacterial meningitis [13, 14]. Except for emergencies, 75% of the antibiotics prescribed are used in upper respiratory tract diseases. These diseases are mainly counted as otitis media, sinusitis, pharyngitis, bronchitis and non-specific upper respiratory tract infections. It is possible to say that children lead the way among the primary users of antibiotics, as these prescribed diseases are frequently seen in childhood [16-21].

In the rational and safe use of antibiotics in children, treatment should be planned based on developmental physiology and pharmacology. Stomach capacity, absorptive capacity, peristalsis in childhood

It should be taken into account that physiological factors such as It is possible to observe systemic toxicity in newborns and infants with the elimination mechanism that is not mature yet [22-24].

Another danger posed by the irrational use of antibiotics is the development of drug resistance. This situation leads to the conclusion that antibiotics in commercial use will disappear in the near future and will not contribute to patient treatment. Therefore, serious studies on the irrational use of antibiotics are required. In this context, a large number of studies on antibiotics have started to be carried out in Iraq and in the world. Increasing the number of studies and informing the public and health workers should be the basis. In our research, the data of the questionnaire study conducted by the parents on the rational use of antibiotics on children in the Pediatric Service Department of Baghdad / Hospital in 2021-2016 were evaluated. With this study, it was aimed to observe the level of awareness of parents in the rational use of antibiotics.

## 2. Material and Method

### 2.1 Description of Examples

In order to measure the level of consciousness of parents in the rational use of antibiotics on parents, a classical and test questionnaire was applied to a total of 248 people (206 mothers and 42 fathers) who had at least one child who applied to Baghdad / Hospital, which was included as a result of informing with the permission of the ethics committee, numbered 2021/1885. questions were applied. The purpose of the survey was explained to the parents who participated in the survey and 21 questions included in the survey were asked about the education status of the patients, age group, number of children, how, when, how and in which situations they used antibiotics. With the questions asked to the parents, it was aimed to determine to what extent rational drug use is used consciously in the society and to measure the deficiencies of awareness-raising studies on this issue.

### 2.2 Statistical analysis

The responses of the parents to the questionnaire on rational antibiotic use were evaluated with the SPSS 21.0 statistical package program. Intergroup evaluations were made with chi-square test and Student's t test.

## 3. Results

206 mothers and 42 fathers were included in our study as parents. The demographic data of the parents are shown in Table 1.

Regardless of the parents, 9% of the parents reported that they first took their children to the doctor when they had a fever, 38% reported that they took a shower with warm water, and 52% reported that they used antipyretic drugs. In addition, the most known antibiotic by parents was Augmentin with a rate of 37%. Again, 88% of the parents said that they read the package insert of the antibiotic before using it (Figure 1 and Figure 2). The rate of those who prescribed antibiotics after treatment was 93% among the parents. Data on parents' use of antibiotics for their children are given in Table 2.

The following findings were obtained in relation to the cases where antibiotics were used in excessive doses or randomly; while the rate of parents who said that the antibiotic would have an effect in case of overdose was 4.5%, 86.5% said no, and 9% did not have any idea about it. The rate of those who think that the drug will be ineffective as a result of random antibiotic use is 71.5%.

In cases where the symptoms of the disease started to improve, 37% of the parents preferred to discontinue the drug treatment, while the rate of those who said that they would continue using the drug for the period recommended by the doctor was observed as 26%. Parents in all age groups reported that they first used antipyretic drugs when their children got a fever (20-30 years=51.8%, 30-40 years=53.9%, 40 and over=47.1%). In addition, the most known antibiotic in all age groups by parents was Augmentin with a rate of about 35%. The rate of those who took antibiotics after treatment among the parents was the highest with 93.9% in the parents between the ages of 20-30. Again, 89.7% of parents between the ages of 20-30 said that they read the package insert of the antibiotic before using it. The findings we obtained when we evaluated the parents according to age groups are shown in Table 3.

The following findings were obtained when the parental age groups were compared in relation to the overdose or random use of antibiotics; Parents aged 40 and over who said that antibiotics would be effective in case of overdose were ranked first with 5.7% compared to the other two age groups, while the rate of saying no for parents aged 20-30 was found to be 90.5%.

The rate of those who think that the drug will be ineffective as a result of random antibiotic use was in the first place with 82.9% in the parent group aged 40 and over.

In cases where the symptoms of the disease begin to improve, 47.1% of parents over the age of 40 said they would continue drug treatment, while 41.6% of parents between the ages of 20-30 preferred to stop using the drug.

When we categorize the parents according to their educational status, it was seen that the first intervention when a child has a fever in all classes is the use of antipyretic drugs (Primary school and below= 51.1%, secondary school-high school= 51.8%, University= 53.3%). Regardless of educational status, the most widely recognized antibiotic among parents is Augmentin with 37%.

**Table 1:** Demographic information of parents

demographic data	Mom	Baba
<b>Age range</b>		
20-30	77 (% 91,7)	7 (8.3%)
30-40	103 (% 79,8)	26 (20.2%)
>40	26 (% 74,3)	9 (25.7%)
<b>Education level</b>		
Primary school and below	42 (20.4%)	3 (7.1%)
Middle School-High School	98 (47.6%)	14 (33.3%)
University	66 (32%)	25 (59.5%)
<b>Number of children</b>		
1	80 (38.8%)	18 (% 42,9)
2	92 (% 44,7)	21 (% 50)
≥ 3	34 (% 16,5)	3 (% 7,1)

The proportion of parents who received antibiotics after treatment was 93% on average in all three education groups. The rates of reading the prospectus of antibiotics are as follows; Primary school and below= 86.4%, secondary school-high school= 91.3%, University= 86.9% (Figure 3). The findings we obtained when we evaluated the parents according to their educational status are shown in Table 4. The following findings were obtained when the parental age groups were compared in relation to the cases where antibiotics were used in excessive doses or randomly; Secondary school-high school graduate parents who said

that antibiotics would be effective if they were used in excessive doses took the first place with 7.2%.

The rate of those who think that the drug will be ineffective as a result of random antibiotic use was in the first place among university graduates with 82.2%.

In cases where the symptoms of the disease started to improve, 52.3% of the university graduate parents said that they would continue drug treatment, while 54.8% of the parents who graduated from primary school preferred to stop using the drug.

**Table 2:** Data on parental use of antibiotics for their children

Data on Antibiotic Use Purpose of Antibiotic Use	Mom	Father
Cause of illness	149 (%77,2)	29 (%78,4)
doctor's advice	44 (%22,8)	8 (%21,6)
<b>Obtaining Antibiotic Usage Information</b>		
Doctor	126 (%65,3)	28 (%70)
Pharmacist	20 (%10,4)	5 (%12,5)
Doctor and Pharmacist	37 (%19,2)	6 (%15)
Reading the prospectus	10 (%5,2)	1 (%2,5)
<b>Considerations in the Use of Antibiotics Points</b>		
Doctor's recommendation	15 (8.4%)	5 (12.8%)
Conditions (dose, time, storage condition, etc.)	123 (68.7%)	24 (61.5%)
allergic side effect	41 (22.9%)	10 (25.6%)
<b>Retaining Antibiotics</b>		
Yes	27 (%14,1)	9 (%22)
No	165 (%85,9)	32 (%78)
<b>Dose Determination</b>		
Doctor	123 (%66,7)	35 (%85,4)
Pharmacist	12 (%6,3)	2 (%4,9)
Prospectus	51 (%7)	4 (%9,8)
<b>Antibiotic Usage Period</b>		
1-10 days	96 (%47,3)	15 (%36,6)
3-5 days	25 (%12,3)	7 (%17,1)
Doctor's Advice	65 (%32)	18 (%43,9)
Other	17 (%8,4)	1 (%2,4)
<b>In Case of Unexpected Side Effects</b>		
I will go to doctor	180 (%89,6)	38 (%95)
I apply to the health institution	21 (%10,4)	2 (%5)

**Table 3:** Data on antibiotic use when we evaluated parents according to age groups

Education Level	20-30 years	30-40 years	>40
Primary school and below	3(3.6%)	32 (24.8%)	10 (%28,6)
Middle School-High School	57 (67.9%)	47 (36.4%)	8 (%38,8)
University	24 (28.6%)	50 (38.8%)	17 (%48,6)
<b>Number of children</b>			
1	50 (59.5%)	44 (34.1%)	4 (%11,4)
2	32 (38.1%)	59 (45.7%)	22 (%62,9)
≥3	2 (2.4%)	26 (20.2%)	9 (%25,7)

<b>Purpose of Using Antibiotics</b>			
Cause of illness	53 (70.7%)	99 (81.8%)	26 (%76,5)
doctor's advice	22 (29.3%)	22 (18.2%)	8 (%23,5)
<b>Obtaining knowledge of using antibiotics</b>			
Doctor	55(69.9%)	77 (62.1%)	22 (%73,3)
Pharmacist	6 (7.6%)	17 (13.7%)	2 (%6,7)
Doctor and Pharmacist	18 (22.8%)	19 (15.3%)	6 (%20)
Reading the prospectus	11 (8.9%)	-	-
<b>Points to consider in the use of antibiotics</b>			
Doctor's recommendation	6 (8.3%)	9 (7.6%)	5 (%18,5)
Conditions of use of the drug (dose, time, storage condition, etc.)	48 (66.7%)	80 (67.2%)	19 (%70,4)
allergic side effect	18 (25%)	30 (25.2%)	3 (%11,1)
<b>Availability of spare antibiotics</b>			
Yes	8 (10.1%)	18 (14.6%)	10 (%32,3)
No	71 (89.9%)	105 (85.4%)	21 (%67,7)
<b>Dose Determination</b>			
Doctor	47 (61.8%)	86 (69.4%)	28 (%93,3)
Pharmacist	5 (6.6%)	9 (7.3%)	-
Prospectus	24 (31.6%)	29 (23.4%)	2 (%6,7)
<b>Antibiotic use period</b>			
1-10 days	40 (47.6%)	62 (49.6%)	9 (%25,7)
3-5 days	18 (21.4)	13 (10.4%)	1 (%2,9)
doctor's advice	20 (23.8%)	39 (31.2%)	24 (%68,6)
Other	6 (7.1%)	11 (8.8%)	1 (%2,9)
<b>In Case of Unexpected Side Effects</b>			
I will go to doctor	71 (87.7%)	114 (91.2%)	33 (%94,3)
I apply to the health institution	10 (12.3%)	11 (8.8%)	2 (%5,7)

**Table 4:** Data obtained when parents were evaluated according to their educational status

	<b>Primary school and below</b>	<b>Middle School-High School</b>	<b>University</b>
<b>Number of children</b>			
1	7 (15.6%)	53 (47.3%)	38 (41.8%)
2	17 (37.8%)	48 (42.9%)	48 (52.7%)
≥3	21 (46.7%)	11 (9.8%)	5 (5.5%)
<b>Purpose of Using Antibiotics</b>			
due to illness	33 (75%)	79 (81.4%)	66 (74.2%)
doctor's advice	11 (25%)	18 (18.6%)	23 (25.8%)
<b>Obtaining knowledge of using antibiotics</b>			
Doctor	26 (59.1%)	68 (64.8%)	60 (71.4%)
Pharmacist	7 (15.9%)	14 (13.3%)	4 (4.8%)
Doctor and Pharmacist	6 (13.6%)	20 (19%)	17 (20.2%)
By reading the prospectus	5 (11.4%)	3 (2.9%)	3 (3.6%)
<b>Points to consider in the use of antibiotics</b>			
doctor's recommendation	5 (12.2%)	5 (5.3%)	10 (12.2%)
Conditions of use of the drug (dose, hour, storage condition, etc.)	25 (61%)	67 (70.5%)	55 (67.1%)
allergic side effect	11(26.8%)	23 (24.2%)	17 (20.7%)
<b>Availability of spare antibiotics</b>			
Yes	8 (18.6%)	10 (9.4%)	18 (21.4%)
No	35 (81.4%)	96 (90.6%)	66 (78.6%)
<b>Dose Determination</b>			
Doctor	27 (61.4%)	68 (66%)	66 (79.5%)
Pharmacist	4 (9.1%)	5 (4.9%)	5 (6%)
Prospectus	13 (29.5%)	30 (29.1%)	12 (14.5)
<b>Antibiotic use period</b>			
1-10 days	26 (57.8%)	51 (45.9%)	34 (38.6%)
3-5 days	4 (8.9)	16 (14.4%)	12 (13.6)
Doctor's Advice	13 (28.9%)	33 (29.7%)	37 (42%)
Other	2 (4.4%)	11 (9.9%)	5 (5.7%)
<b>In Case of Unexpected Side Effects</b>			
I will go to doctor	42 (93.3%)	100 (91.7%)	76 (87.4%)
I apply to the health institution	3 (%6,7)	9 (%8,3)	11 (%12,6)

#### 4. Discussion and Conclusion

As defined by the World Health Organization, "Following the rules for patients to take medication appropriate for their disease and individual characteristics, with appropriate duration and use, and at reasonable cost, is known as 'RDU'

(1, 2). Incorrect, unnecessary and ineffective use of antibiotics can cause Causes of misuse include non-compliance with prescriptions prescribed by doctors, taking prescription medications on their own, misuse of antibiotics, excessive use of injections, excessive use of relatively safe

medicines, use of nonessential medicines, and use of non-essential medicines. Expensive, and doctors do not adequately inform the patient about treatment and health problems. The staff can be considered to make a mistake in administering drugs [3, 22-26]. This situation revealed the necessity of AIK, which was first identified by the World Health Organization in 1985 (8 Studies have shown that according to data from the World Health Organization (WHO) in 2006, the amount allocated to pharmaceutical expenditures is about 859 billion US dollars worldwide. For pharmaceutical expenditures in the world total output is 1.52% on average, the share of pharmaceutical expenditures in total health expenditures is 24.9% on average (1.6-8.27). In our country, the share of expenditures for medicines and medical consumables in total health expenditures was reported at 33.5% for the year 2000 [8].

Antibiotics rank fifth in the order of consumption by cost in the pharmaceutical industry in developed countries. In Iraq, it occupies 16.3% of the drugs consumed and ranks first [8, 11, 15]. It has been reported that antibiotics come at the top of the list among drug use in general in Iraq, and according to the data of the Iraqi Ministry of Health, 21% of the annual per capita consumption of drugs in the financial table is antibiotics and similar drugs [26, 27]. According to this research, the share of total expenditure on medicines and non-durable medical consumables of the total health expenditure was 33.5%. The total pharmaceutical expenditure in 2021 amounted to 3 billion Iraqi dinars, and the total pharmaceutical expenditure in 2022, 3.4 billion Iraqi dinars (9). In a 2018 ministry study, 87.6% of prescriptions written for "viral upper respiratory infection," the most frequently prescribed diagnosis, were found to be irrational (9). The rational use of antibiotics is very important because the irrational use of antibiotics affects not only the individual, but also the society.

The age range of the parents participating in our study was questioned and the effect of age and level of consciousness was wanted to be seen. It was observed that 91.7% of the mothers were in the 20-30 age range, and 25.7% of the fathers were 40 years and older. To measure the connection between the age range and the state of consciousness, when the symptoms of the disease began to subside, the parents' continued use of the drug was questioned. It was observed that they continued the drug compared to the parents between the ages of 20-30. Considering the answers about the use of antibiotics more than necessary, age and level of consciousness

It was concluded that it increased proportionally. It was observed that the parents aged 40 and over gave answers that the use of large amounts of antibiotics in the parents did not have an effect at a higher rate compared to other age groups.

Nearly half (47.6%) of the parents participating in our study are secondary school graduates, 32% of them are university graduates, 59.5% of the fathers are university graduates and 33.3% are secondary-high school graduates.

When we evaluated the parents according to their educational status, all of them, regardless of class, said that the first intervention when their children get a fever is to use antipyretics. There was also no significant difference in discarding the remaining antibiotics after treatment.

The most common situation in the irrational use of antibiotics is the administration of antibiotics at the time of fever. Due to the prevalence of misinformation, the attitude

of the parents at the time of the fire was asked in the questionnaire. In the answers given by the parents, it was seen that when their children had a fever, they used their own methods such as taking a warm shower without using any antipyretic drugs, taking off the child's clothes, or taking them to the doctor. The responses received showed that there was no antibiotic use during fever and that the interventions were made consciously. According to our survey results of parents, 9% take their children to the doctor when they have a fever, regardless of parents. With the same survey study, it was found that 38% of them had a warm shower and 52% of them used antipyretics. In the answers given as antipyretic, the fact that the antipyretic was given together with the generic names used in the market made us think that the level of consciousness was high. In a study by Chan *et al.* in Malaysia, when the purpose of antibiotics was questioned, it was seen that the majority of them used antibiotics in the treatment of fever and cough without any discrimination (76% fever, 69% cough) [28]. Unlike the study of Chan *et al.*, it was seen that the answers in our survey results were not in the direction of using antibiotics at the time of fever or cough.

In our study, the names of antibiotics used by the parents were asked and the existence of different drug groups that the parents knew as antibiotics were questioned. It has been observed that almost all of the parents, regardless of education, age and gender, gave the correct antibiotic names. In a study conducted by Mitsi *et al.*, 85.2% of antibiotic names were given correctly, similar to our study [29]. In this study, the fact that the patients were conscious about the names of the drugs suggested that they knew in which indications the prescribed drugs were used.

In our survey results, it was seen that the most known antibiotic was Augmentin. The fact that Augmentin is the most affordable antibiotic used in the market makes us think that it is the most widely used and known antibiotic. In addition, Augmentin is a broad-spectrum antibiotic and is known to be successful in the treatment of infection. Augmentin is a broad-spectrum antibacterial drug that is effective against many types of bacteria and microbes. It is used in lower respiratory tract infections such as recurrent tonsillitis, sinusitis, otitis media, bacterial infections such as urinary tract inflammation, urethra, lung inflammation, soft tissue infections. According to the principles of AIK, it requires the purchase of an effective drug at an affordable price. This situation makes us think that the "Augmentin" answer given by the parents and the AIK principles overlap. The fact that the parents participating in the survey did not use drugs from different groups in the treatment of infection when their children were sick and that they received medical help in this regard suggested that their level of awareness was high.

When parents who participated in our study were asked what the purpose of antibiotic use was, the answers given were mostly due to the right drug and the right disease. In addition, it was questioned whether parents read the package inserts of antibiotics to measure their level of consciousness, and it was observed that 88% of them read the package insert. In addition, when it was questioned what they did with the antibiotics left in their hands after the treatment, it was observed that 93% of the parents discarded the remaining antibiotics. This situation made us think that the parents knew that the effects of antibiotics would not be

valid after they were opened and they were aware that they would not be used again.

When the parents participating in our study were asked how they used the antibiotics they used, it was seen that the majority of them came from the doctor, and the fact that the answers were from the pharmacist and the prospectus, which shows that the parents did not use antibiotics based on their own knowledge, but took medical help.

In order to question the conscious use of antibiotics, it was questioned what are the points to be considered in the use of antibiotics. It was observed that the majority of the parents who participated in the survey said that they paid attention to the conditions of use such as dose, time, storage conditions, and the rest of them paid attention to the doctor's recommendation and side effects. This situation made us think that the conditions of use such as the right time and appropriate dose, which are the basic principles of rational antibiotic use, are considered by the parents.

In order to evaluate the attitudes of the parents participating in our study, their availability of spare antibiotics was questioned. It was observed that most of them did not have spare antibiotics. In a study by Gozalez *et al.* in Spain, unlike the study we conducted, it was observed that 37% of parents had at least one spare antibiotic at home <sup>[30]</sup>. For rational use, antibiotics must be prescribed by a doctor when they should not be kept at home.

When the parents participating in the survey were questioned about how they determined the dose, it was seen that the majority used it as the doctor said, and the rest determined by reading the pharmacist and the prospectus. When the duration of use of antibiotics was questioned, it was observed that the use of antibiotics was high between 1-10 days. This situation made us think that they continued to use it even though the symptoms of the disease started to pass.

When the parents who participated in our study were asked what they did when an unknown side effect was observed, the majority of them answered by stating that they should seek help from a physician or health institution. This indicates that parents have chosen the right resource for consultation.

Our study findings show that studies on rational antibiotic use have yielded positive results, but antibiotic use still has the potential to cause serious health problems all over the world and in Iraq. There is a need for more effective studies to increase the awareness of healthcare professionals, doctors, pharmacists, patients and patient relatives about rational drug use.

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