

Assessment of Parental Knowledge, Attitudes and Practice Towards Antibiotic Use in Egyptian Pediatric Community, Qalyubia

Mohammad Amin Aly El-Din

Clinical research department, Abou Al Monagga Central Hospital, Qalyubia, Egypt

ORCID number: 0000-0003-1298-7482- Telephone: (+20)01143022043, Email: Mohamed.ali2@pharma.asu.edu.eg

ABSTRACT

Background: Wrong and too much use of antibiotics are key causes of the worldwide issue of resistance to them. In Egypt, the number of parents not knowing the correct way to use antibiotics for kids is growing. This mistake can cause an increase in infections resistant to antibiotics.

Aim: The purpose of this study is to measure what Egyptian parents know and think about antibiotics for kids, and what they do about it. This can help find misunderstandings and things missed. These findings can then be used to teach parents. **Subjects and Method:** This cross-sectional observational study was conducted at Abou Al Monagga Central Hospital, Qalyubia, Egypt, in December 2023. We gathered this info from 240 parents at Hospital's Pediatric Clinics. **Results:** Initial research shows a big hole in what parents know about when and how long to give antibiotics for kids' infections. Lots of parents like to decide for themselves when to use antibiotics or use ones they have left over, without asking a doctor. Parents' feelings about antibiotics are different. Some think they're a fast fix for colds and the flu, even though these are caused by viruses. Behavior shows a worrisome amount of not sticking with the antibiotics schedule. This leads to unfinished treatments and possible resistance.

Conclusion: There's a big need for special educational plans. They should better parent understanding and thinking related to kids' antibiotics use. By fixing wrong ideas and increasing obedience to given treatments, we can lessen incorrect antibiotic use.

Keywords: Parental Knowledge, Antibiotic Stewardship, Qalyubia, Egypt, Antibiotic Misuse.

INTRODUCTION

A serious concern to Egypt's public health is antimicrobial resistance. Numerous children under the age of five were among the 1.27 million fatalities globally in 2019 that the Global Burden of Disease research estimated were caused by antibiotic resistant illnesses ^(1,2). Antimicrobial resistance was common among Gram-positive, Gram-negative, and candida species in certain Egyptian hospitals. The high rate of resistance to most antibiotics employed, particularly in secondary microbial infections in COVID-19 patients, is concerning, foreshadows a disaster, and necessitates constant observation to prevent the emergence of new strains. An important factor contributing to AMR (Antimicrobial Resistance) in Egypt is the overuse and misuse of antibiotics in both human care and agriculture. Egypt needs better surveillance systems, public education campaigns about responsible antibiotic use, and better antimicrobial stewardship to address this expanding issue ⁽³⁾. Responding to AMR requires a multifaceted "One Health" approach encompassing human, animal, and environmental health sectors ⁽⁴⁾.

As infections develop more resistant to widely used medicines, antibiotic resistance poses an increasing hazard to public health ⁽⁵⁾. Developing successful interventions requires an understanding of the factors that contribute to resistance. The over prescription and abuse of antibiotics, particularly in pediatric populations, is one factor that may be involved ⁽⁶⁾. Pediatric antibiotic use decisions are largely influenced by parents, but little is known regarding the relationship between parental understanding and community-level pediatric resistance patterns.

Numerous studies have looked at parents' attitudes, knowledge, and behaviors regarding the use of antibiotics for common pediatric ailments ⁽⁷⁾. According to a Saudi Arabia (KSA) poll of parents, there are a lot of common misconceptions, one of which is that antibiotics work well for viral infections ⁽⁸⁾. Qualitative studies conducted in several low- and middle-income nations revealed that parents frequently put pressure on medical professionals to prescribe antibiotics because they lacked knowledge on the proper use of antibiotics ⁽⁹⁻¹¹⁾. Few research, meanwhile, have specifically evaluated the connection between pediatric antibiotic resistance and parental understanding. Antibiotic use at the population level and resistance patterns have been found to be correlated by ecological analysis ^(12,13). It is believed that around 50% of pediatric antibiotic prescriptions are influenced by parents ⁽¹⁴⁾. With increased parental information, modeling research projected a 45% decrease in pediatric antibiotic courses ⁽¹⁵⁾. This shows that by prescribing amounts, parental information could have a significant impact on resistance.

One study indicated that there may be a connection between resistance and self-medication with antibiotics among juvenile populations, as seen by the carriage of resistant bacteria in these populations ⁽¹⁶⁾. Few research, meanwhile, have examined the relationships at the individual level between parental education, antibiotic use in children, and resistance transmission. Lack of studies measuring these three elements together represents a significant knowledge gap ⁽¹⁷⁾. To summarize, while it has been proposed that parental knowledge contributes to pediatric antibiotic resistance through suboptimal dosing, there is currently little

empirical data that establishes a clear correlation between knowledge and resistance patterns in individuals or communities^(18,19). Further studies assessing parental understanding in conjunction with antibiotic use and the persistence of resistance across time are required. Additionally lacking are study methods that enable the assessment of knowledge-based treatments on resistance causality^(20,21). To help guide efforts to halt the spread of antibiotic resistance worldwide, these evidence gaps must be filled.

The Aim of this study is to measure what Egyptian parents know and think about antibiotics for kids, and what they do about it. This can help find misunderstandings and things missed. These findings can then be used to teach parents

SUBJECTS AND METHODS

The research was conducted at Abou Al Monagga Central Hospital, situated in Qalyubia, Egypt. It concentrated on pediatric clinics within the hospital, serving a diverse group of children. According to the hospital's records, there were approximately 1200 monthly visits to these clinics. The study included parents of pediatric patients aged 0-12 years who visited these clinics during December 2023.

Because the questionnaire was anonymous and the demographic information gathered cannot be used to identify the participants, it is impossible to connect the data from phases one and three to specific people.

Study Design

A cross-sectional survey-based methodology was employed depending on a similar study⁽²²⁾. This design facilitated the collection of concurrent data regarding parents' knowledge about antibiotic use and practice.

Eligibility Criteria

The participants in this study were parents of children aged 0-12 years who were receiving care in pediatric clinics. The study included a diverse group of patients, covering both those with infectious and non-infectious conditions. Parents of children not within the designated age range, those with critically ill children who were unable to participate, and cases where parental consent was not obtained were excluded from the study.

Sample Size

The study anticipated a 50% response rate from the approximate 1200 monthly visitors to the pediatric clinics, aiming to involve 600 parents. Using a 95% confidence interval, a margin of error of 5%, and an assumed 50% level of adequate parental knowledge, the calculated sample size required was 235 parents⁽²³⁾.

Recruitment and Data Collection

Consecutive sampling methods were used to involve participants in the study. Parents in the clinic waiting areas were approached directly and invited to partake in the study. After getting written approved consent, they completed a printed survey. This survey was designed

to evaluate knowledge, attitudes, and practices regarding the use of antibiotics in pediatric care. Knowledge level was the outcome variable, whereas age, gender, and education were the predictors. Completed surveys were made anonymous.

Survey Instrument

The survey consisted of 18 questions, including multiple-choice and Likert-scale formats⁽²⁴⁾. These questions were adapted from previously validated tools in relevant literature. The survey covered various aspects like knowledge of appropriate indications, effectiveness, side effects related to common antibiotic classes. It also included questions about sociodemographic factors, prior antibiotic exposure, and attitudes towards antibiotic misuse.

Pilot Study: Before the main survey deployment, a pilot was conducted with 20 parents (About 10% of sample size) to evaluate validity, clarity, simplicity, and the time required to complete the questionnaire. It was not included in main study.

Data Analysis

Data were analyzed using IBM SPSS Statistics software version 27.0. For categorical data, frequencies and percentages (Descriptive Statistics) were used and were compared using chi-squared testing. Testing for normality was done using the Kolmogorov-Smirnov test and the Shapiro-Wilk test, with a p-value ≤ 0.05 indicating the data is not normally distributed. For non-normally distributed data, median + interquartile range (IQR) were used.

Ethical consideration:

An official permission to conduct the study was obtained from the Research Ethics Committee at Ministry of Health and Population (Reference 21-2023/13). The research was conducted in compliance with the ethical guidelines established by the 1964 Helsinki Declaration, its subsequent revisions, or equivalent ethical standards.

The study was voluntary, and ethical considerations included outlining the nature and goal of the investigation for each participant as well as providing information about the option to withdraw at any moment.

All of the study participants gave written informed consent, or, in the case that they were unable to give consent, consent was obtained from their family members.

RESULTS

This study analyzes a sample of 240 people in depth, as shown in table 1. Regarding demographic information, the average child age was 36 months, with most kids between 24-72 months old (62.5%). Families typically had two children. The average parent age was 28 years, with most being between 25 and 30 years old (63.3%). Remarkably, 99.6% of parents were female, mainly stay-at-home moms (86.7%). Educational backgrounds varied widely, with a significant portion

having less than a high school diploma (37.5%). Overwhelmingly, the respondents (97.9%) were the mothers of the pediatric patients, showing mothers play a strong role in caregiving.

Table 1: Demographic Information

Variable	No. (Frequency%)
Child Age (Months)	
Median (IQR):	36(18-60)
0-11 months	36(15.0%)
12-23 months	31(12.9%)
24-72 months	150(62.5%)
More than 72 months	23(9.6%)
*p-value:	0.00001
No of Children	
Median (IQR):	2(2-3)
p-value:	<0.00001
Parent Age (Years)	
Median (IQR):	28(25.5-32)
16-19 years	1(0.4%)
20-24 years	17(7.1%)
25-30 years	152(63.3%)
More than 30 years	70(29.2%)
p-value:	<0.00001
Parent Gender	
Female	239(99.6%)
Male	1(0.4%)
Profession	
Housewife	208(86.7%)
Private Sector	29(12.1%)
Public-sector	3(1.3%)
Educational Background	
Bachelor's Degree	22(9.2%)
Graduate/Professional Degree	1(0.4%)
High School Graduate	63(26.3%)
Less than High School	90(37.5%)
Some College/Technical Training	64(26.7%)
Relationship to Pediatric Patient	
Aunt	2(0.8%)
Father	1(0.4%)
Grandmother	1(0.4%)
Mother	235(97.9%)
Relative	1(0.4%)

*Testing for normality was done using Kolmogrov-Smirnov test and Shapiro-Wilk test.

As illustrated in table 2, parents who received information about antibiotic use for their child, were 92 (38.33%). 102 (42.5%) had a very low knowledge level on antibiotic use for children. Most of the participants 179 (74.5%) agreed that "Antibiotics are effective against bacterial infections". 94 (39.17%) agreed that: "Antibiotics are effective against viral infections". For the belief in the use of antibiotics for various conditions, the responses varied: 85 (35.42%) indicated multiple selections, showing a general belief in the broad efficacy of antibiotics. Specifically, 69 (28.75%) believe antibiotics are effective for sore throats, a common but not always appropriate usage depending

on the cause. A combination of conditions—ear infections, sore throats, and urinary tract infections (UTIs)—was selected by 44 (18.33%), highlighting a particular belief in antibiotics' effectiveness for these ailments. Colds and flu, viral infections for which antibiotics are not effective, were still chosen by 29 (12.08%), indicating a misunderstanding of their proper use. Ear infections alone were acknowledged by 7 (2.92%) as needing antibiotics, and urinary tract infections were recognized by 6 (2.50%), both of which are typically bacterial and can be appropriately treated with antibiotics. When asked if they completed the full course of antibiotics, responses varied significantly: 118 (49.17%) confirmed they always complete the full course, reflecting a responsible approach to antibiotic use. However, a notable portion, 72 (30.00%), were not sure if they always followed through with the entire course. Meanwhile, 50 (20.83%) admitted to not completing the full course, a practice that can contribute to the development of antibiotic resistance.

Table 2: Parental Knowledge on Antibiotic Use

Question	No. (%)
Have you ever received information about antibiotic use for your child?	
No	148(61.67%)
Yes	92(38.33%)
Rate your knowledge level on antibiotic use for your child:	
Very Low	20(8.33%)
Low	102(42.50%)
Moderate	82(34.17%)
High	23(9.58%)
Very High	13(5.42%)
Agreement: "Antibiotics are effective against bacterial infections."	
Strongly Agree	51(21.25%)
Agree	179(74.58%)
Neutral	9(3.75%)
Disagree	1(0.42%)
Agreement: "Antibiotics are effective against viral infections."	
Strongly Agree	4(1.67%)
Agree	94(39.17%)
Neutral	88(36.67%)
Disagree	51(21.25%)
Strongly Disagree	3(1.25%)
Belief in antibiotics usage for various conditions:	
Multiple selections	85(35.42%)
Sore throat	69(28.75%)
Ear infections, Sore throat, UTI	44(18.33%)
Colds and flu	29(12.08%)
Ear infections	7(2.92%)
Urinary tract infections	6(2.50%)
Do you complete the full course of antibiotics?	
Yes	118(49.17%)
Not sure	72(30.00%)
No	50(20.83%)

Table 3 brings to light one key aspect of what parents think about finishing antibiotic treatments. It shows that a big chunk of 118 participants, making up 49.17%, shared they always finish their prescribed antibiotics. On the other hand, there's a noticeable group of 72 participants, about 30.00%, who aren't sure if they've gone through their entire treatment or not. This suggests there might be some gaps in understanding or remembering. Moreover, 50 people or 20.83% confessed they didn't finish their antibiotics, causing worries about possible antibiotic resistance and whether the treatment works.

Regarding tables 4, when it comes to knowing about antibiotic resistance, the survey showed that most respondents, 171 of them (71.25%), don't know about it. Though, when asked if antibiotic resistance is a

serious public health problem, 99 people (41.25%) said yes. Yet, a big group, 124 (51.67%), isn't sure. Almost everyone, 190 people (79.17%), don't know about "antibiotic stewardship". The majority, 166 people (69.17%), reported their child has never had a diagnosis of a resistant infection. But 71 folks (29.58%) aren't sure.

Regarding table 5, the p-values suggest the significance of associations between these variables, with particularly notable results for the relationship between educational background and received information on antibiotic use, which indicates a statistically significant association. Other comparisons, such as parent gender versus educational background and received information on antibiotic use versus parent gender, showed no significant association based on their p-values.

Table 3: Parental Attitudes

Question	No. (%)
Has your child ever been prescribed antibiotics in the past year?	
Yes	198(82.50%)
No	42(17.50%)
If yes, for what condition were antibiotics prescribed? (Multiple responses possible)	
Respiratory tract infection (e.g., bronchitis, pneumonia)	67(33.84%)
Colds and flu	47(23.74%)
No	40(20.20%)
Other	16(8.08%)
Ear infections	16(8.08%)
Colds and flu + Ear infections + Sore throat + UTIs	16(8.08%)
Sore throat	15(7.58%)
Ear infections + Sore throat + UTIs	9(4.55%)
Skin Infection	6(3.03%)
Urinary tract infections	6(3.03%)
Gastroenteritis	2(1.01%)

Table 4: Parental Practice

Question	No. (%)
Are you aware of antibiotic resistance?	
Yes	25(10.4%)
No	171(71.25%)
Not sure	44(18.33%)
Do you believe antibiotic resistance is a serious public health issue?	
Yes	99(41.25%)
No	17(7.08%)
Not sure	124(51.67%)
Have you ever heard about the concept of "antibiotic stewardship"?	
Yes	7(2.92%)
No	190(79.17%)
Not sure	43(17.92%)
If yes, please specify the type of antibiotic-resistant infection, if known.	
No	236(98.33%)
I don't know.	2(0.83%)
Not sure	1(0.42%)
Respiratory tract infection (e.g., bronchitis, pneumonia)	1(0.42%)

Table 5: Demographic Associations and Comparisons

Parent Gender vs Educational Background						χ^2	p-value
Parent Gender	Bachelor's degree	Graduate or professional degree	High school graduate	Less than high school	Some college/technical training		
Female	22	1	62	90	64	2.821	0.588
Male	0	0	1	0	0		
Parent Gender vs Received Information on Antibiotic Use						0.000	1.000
Parent Gender	No		Yes				
Female	147		92				
Male	1		0				
Educational Background vs Received Information on Antibiotic Use						14.036	0.007
Educational Background	No		Yes				
Bachelor's degree	6		16				
Graduate or professional degree	0		1				
High school graduate	41		22				
Less than high school	60		30				
Some college/technical training	41		23				

DISCUSSION

From the previous data, there is an important correlation between a parent’s education and their understanding of antibiotics. The results demonstrate a need for customized educational programs tailored to people's existing comprehension. The age range of most children being 24-72 months pinpoints a pivotal developmental stage for youngster healthcare promotion. The prevalence of mothers who stay at home signifies this population may benefit most from focused education. The parents' most common age bracket of 25-30 years offers beneficial demographic particulars to steer curriculum formation.

Many parents do not fully comprehend appropriate antibiotic use and the growing issue of resistance. A significant number reported not receiving any information about their child's prescribed antibiotics. Additionally, a sizable portion acknowledged having little baseline knowledge on the topic, underscoring the urgent need to educate parents on judicious antibiotic use. Furthermore, widespread misconceptions and gaps in public knowledge regarding antibiotic resistance indicate a troubling public health risk. The restricted parental understanding of antibiotic stewardship principles demands prompt actions to enhance awareness and increase understanding. This research uncovers diverse parental views on using antibiotics for certain situations. Some parents approve of antibiotics for illnesses such as strep throat, ear infections, urinary tract infections, and skin problems. Others question the necessity of finishing the full antibiotic prescription, underscoring intricate and differing stances toward antibiotic usage.

The results highlight the serious need for thorough parental education on antibiotics, resistance, and

children's medical care. Tailored lessons are crucial to deliver focused learning. Furthermore, misunderstandings must be confronted with fact-based tactics to enhance comprehension and encourage suitable antibiotic application. This re-search supplies an empirical basis for building helpful programs filling in knowledge shortfalls and advancing prudent antibiotic management among parents. Although previous studies have looked at parental opinions on antibiotic usage in children in other nations, there isn't much that particularly looks at this topic in the context of Egypt only one study was found but among Prescribers⁽²⁵⁻²⁷⁾. Antibiotic abuse is a contributing factor in Egypt's high rates of antibiotic resistance. Understanding parental knowledge and attitudes is essential for promoting appropriate antibiotic use in Egyptian pediatric care, as parents are key decision-makers when it comes to their children's usage of antibiotics. This study offers a useful analysis of the misunderstandings, inadequate parenting techniques, and information gaps that exist now in Egypt. The results show that to enhance parental knowledge and behavior regarding the use of antibiotics in children, there is an immediate need for specialized educational programs.

CONCLUSION AND RECOMMENDATIONS

Parents need to better understand when antibiotics are appropriate and how resistance develops. Their attitudes about antibiotics vary. To address this, educational programs for parents are important. These programs should meet different learning needs based on education, age, and parenting role. The goals are clear: dispel myths, stress taking the full antibiotic course, and spread awareness about resistance and proper use. Healthcare experts, teachers, and public health workers must work together. Their evidence-based lessons can fill knowledge gaps and encourage parents to use antibiotics responsibly. Implementing such initiatives is

key to improving health nationwide and curbing misuse and resistance issues with antibiotics.

LIMITATION

- The study only looked at parents at one hospital in Egypt. The results may not apply to other places.
- The study did not look at how severe infections were, whether antibiotics were taken correctly, or other factors that could impact the results.
- The study took place at one point in time. It showed connections but not causes.

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