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Parents awareness toward antibiotics use in upper respiratory tract infection in children in Western Libya

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Abstract

Background: Upper respiratory tract infections (URTIs) are one of the most common acute illnesses in children. It is noteworthy that children use medical services related to URTIs and receive medications to treat their symptoms. Antibiotics still continue to be given although most of these infections are of viral origin. Inappropriate practice may contribute to antibiotic resistance. This issue may be more common in low- and middle-income countries. The current study aims to evaluate the knowledge and attitudes of /carers of children with upper respiratory tract infections regarding antibiotic use in western part of Libya.

Methods: a descriptive cross-sectional survey study was carried out between March and June 2024 for parents/ carers aged > 18 years of age with a child under 18 years' old who came to the general pediatrics clinics of Zawia Medical Center and Sabratha Teaching Hospital.

Results: five hundred parents/carers responded to the questionnaire. The majority (71.4%) of the responders chose physicians as the main source of information about antibiotic use. About forty percent of the participants agreed that most URTIs are viral in origin and self-limiting illness that does not need antibiotics. However, 25.4% of participants believed that antibiotics should not be given to all children who have a fever. Nearly seventy percent of the responders were aware that inappropriate use of antibiotics reduces antibiotic efficacy and will lead to bacterial resistance. Fever was the dominant symptom among others of URTI, that would make (65.4%) carers to visit physicians. Nearly half of the respondents (44%) never asked pediatricians to prescribe antibiotics for their children were.

Conclusion: According to the results of the current study, parents'/carers' have to some extent adequate knowledge and attitude. It is important to inform parents, pediatricians and pharmacists about the use of antibiotics, and to be more careful about the prescribing of antibiotics, and if necessary, penalties should be imposed by the government in order to prevent unnecessary antibiotic prescriptions.
Keywords: Upper respiratory tract infections, antibiotics, knowledge, Attitude, Practices.

Introduction

Upper respiratory tract infections (URTIs) are one of the most common acute illnesses affecting children. These illnesses include conditions like the common cold, sore throat, and ear infections [1]. It is noteworthy that children use medical services related to URTIs more than other age groups. Consequently, this has a great burden on the health care system[2]. URTIs are usually caused by viral infection, which are self-limiting and have mild symptoms for a short duration. Most children improve without medical treatment and are free of complications [3, 4]. Only those who experience more severe, prolonged, recurrent or complicated infections need to visit pediatricians [5].

Evidence showing that antibiotic treatment offers little or no benefit to most patients presenting with URTIs [6-8]. But rather, frequent use of antibiotics in such cases may be associated with many side effects [9]. One of the most serious concerns of the over prescription of antibiotics is the development of microbial resistance [10-12], which is considered a major global public health threat [13]. Annually, 1.27 million global deaths in 2019 due to resistance infections [13]. According to the Lancet report [14], infections caused by multidrug-resistant (MDR) bacteria lead to approximately 200,000 newborns.

Parents play a key role in the decision-making process regarding the treatment plans of their children, including the use of antibiotics. Their level of awareness and perceptions of antibiotics can significantly influence whether these medications are sought, prescribed, and used appropriately [15]. However, studies suggest that many parents have misconceptions about the effectiveness of antibiotics for viral infections, often believing that antibiotics are necessary for all infections, regardless of the underlying cause [16]. This lack of awareness may be exacerbated by many factors that may include: doctors prescribing antibiotics excessively due to uncertainty in

diagnosis [17]; the easy access to antibiotics for self-medication [18]; parents' pressure to prescribe antibiotics [18, 19]. Furthermore, doctors may prescribe antibiotics for children with viral URTIs only to meet parents' expectations for such treatment [20].

In Western Libya, where both urban and rural populations may experience disparities in healthcare access, the misuse of antibiotics for viral infections, such as URTIs, might be problematic. Despite the fact that antibiotics are ineffective against viral infections, they are often prescribed by healthcare providers [21], and, in turn, parents may expect or demand antibiotic treatment for their children [22]. The lack of recognition about the differences between viral and bacterial infections, and the potential harms of inappropriate antibiotic use, such as antibiotic resistance, are key factors contributing to this ongoing challenge [18, 19].The primary aim of this study is to assess the level of awareness among parents/carers in Western Libya regarding the use of antibiotics for treating URTIs in children. This includes exploring their knowledge of when antibiotics are necessary, their understanding of potential side effects, and their perceptions of healthcare providers' roles in antibiotic prescribing. By identifying gaps in knowledge and understanding, this study seeks to inform targeted interventions that can improve antibiotic use, reduce resistance, and ultimately protect children's health in this region.

Methods

A descriptive cross-sectional study was conducted using a questionnaire. The study tool was developed by reviewing available questionnaires in the literature. The questionnaire was adapted from published validated Greek questionnaires that were also utilized in previous studies [1, 18, 23]. The questionnaire included an explanation of the purpose of the study at the beginning. The questionnaire consists of four sections; the first one includes questions that address the basic sociodemographic characteristics. The second section includes questions that assess participants' knowledge about antibiotics. The third section addresses participants' attitudes towards antibiotic use and the fourth section examines participants' behaviors towards antibiotic prescribing in pediatric practice.

The study was conducted from March to June 2024. The study took place at Zawia Medical Center and Sabratha Teaching Hospital where the responders were approached and asked for participation. These are governmental hospitals that provide Pediatric health services with the

highest flow of patients throughout the working days. The questionnaire was administered to the responders by well- trained intern doctors in the patients' waiting room. So those who agreed to participate in the study were continued to the next parts. The questionnaire was answered by only one parent/carer when they came with their child for counseling. After the completion and return of the questionnaires, the data was compiled for analysis.

Ethical considerations:

Official approval from the responsible authorities (Zawia Medical Center and Sabratah Teaching Hospital) was obtained. The objective of the study was explained to the participants. The data collectors took a verbal consent to participate in the study before starting the questionnaire and there was no obligation to participate.

Statistical Analysis

Statistical analysis was carried out in the IBM SPSS Statistics for Windows, Version 23.0. The responses were re-coded; each correct response was awarded one mark and each wrong and unsure response awarded zero. To analyze the data effectively, we utilized the mean score as a cutoff value to categorize respondents into two distinct groups; respondents scoring above the mean were classified as having good knowledge. Conversely, those scoring below the mean were classified as having limited knowledge. The data were summarized in tables and figures. Descriptive statistics, including frequencies, percentage, mean, and standard deviations, were calculated as appropriate.

Proportions of the observed variable studied were compared using Chi-square test wherever appropriate and P-value< 0.05 was considered statistically significant.

Results

Five-hundred parents/carers participated in the current study. More than sixty percent of the participants were mothers (68.6%) and the age range of the study population (40.8%) was mostly between the ages of 30–39. More than half of the respondents (59.4%) have a Bachelor degree and 65% of them had a monthly income between 1-3 thousand Libyan Dinars. More than half of them (61%) have 1-3

Table 1. Socio-demographic variables of the study population (n=500)

Study variable	Frequency (%)
Caregivers	
Mother	343 (68.6)
Father	89 (17.8)
Others	68 (13.6)
Age group in years	
18-29	192(38.4)
30-39	204 (40.8)
>40	105 (21)
Educational level of the mother	
Elementary/ Intermediate school	28 (5.6)
High school	141 (28.2)
Bachelor degree	297 (59.4)
Postgraduate	34 (6.8)
Educational level of father	
Elementary/ Intermediate school	44 (8.8)
High school	181 (36.3)
Bachelor degree	222 (44.5)
Postgraduate	52 (10.4)
Income level	
Low (<1000) LYD	107 (21.4)
Middle (1000-3000) LYD	325 (65)
High (>3000) LYD	68 (13.6)
Number of children below 18 years old	
1-3 children	305 (61)
3-4 children	151 (30.2
>4 children	44 (8.8)
Number of children who have chronic diseases	
N/A	375 (75)
1-3 children	107 (21.4)
4-5 children	18 (3.6)
>4 children	0

children and 75% do not have chronic illnesses. Sociodemographic features of the study population presented in Table 1.

LYD:Libyan Dinars

Knowledge

Pediatricians have been chosen as the major source of information about antibiotics (71.4%), followed by pharmacists (19%). Figure 1 illustrates the sources of information which respondents turned to. Figure 2 presents the responses to questions related to knowledge. One quarter of the respondents agreed to use antibiotics in any child with fever. 22.2% of the respondents considered that antibiotics could cure the infections caused by the viruses and 58% believed that their child would recover faster by antibiotics. A total of 56.6% of the respondents

believed that antibiotics can prevent complications associated with upper respiratory tract infections. 75.4% of the respondents think that antibiotics are overused and 69.6% agreed that inappropriate use of antibiotics may alter the effectiveness of treatment and increase the risk of bacterial resistance. While 24% of the respondents believed that antibiotics had no side effects and 43.8% thought that new antibiotics could be developed continuously.

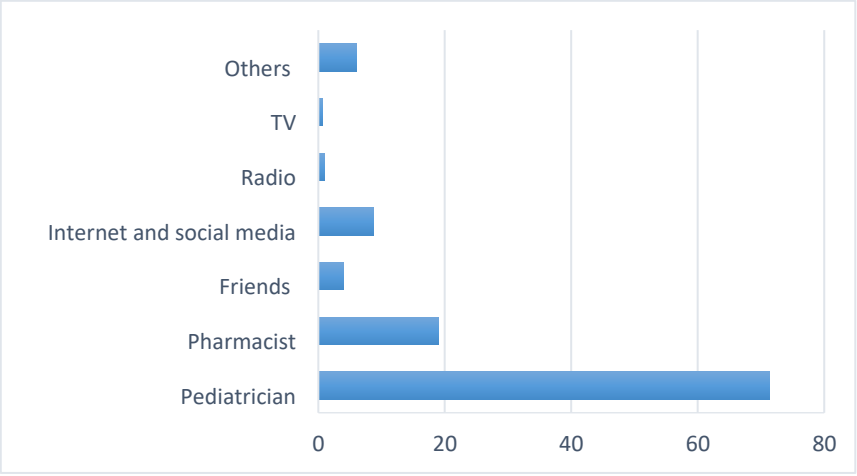


Figure 1 Distribution of sources of information about antibiotics

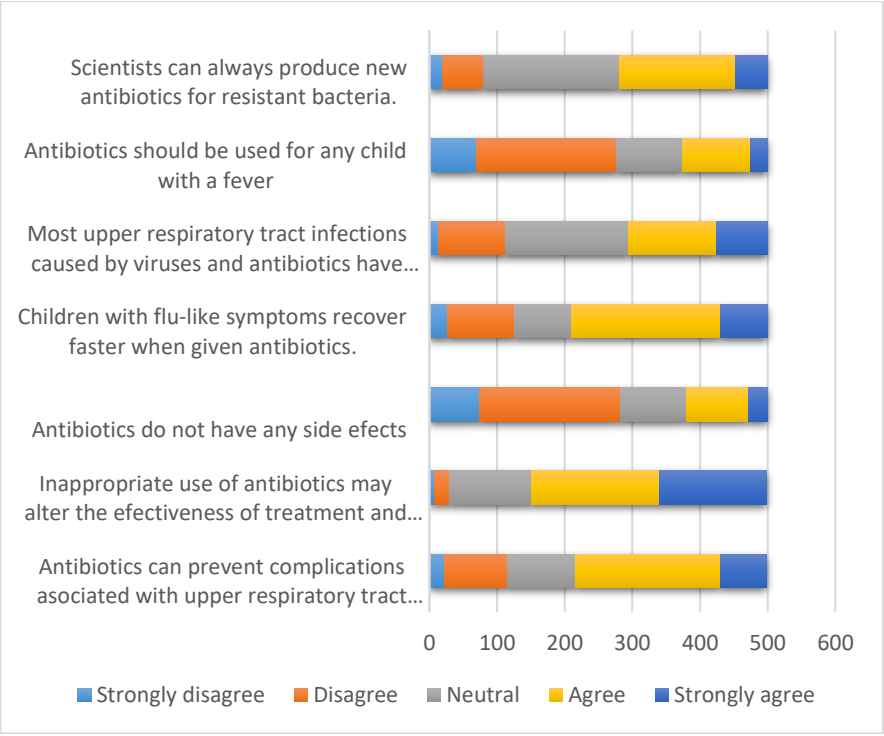


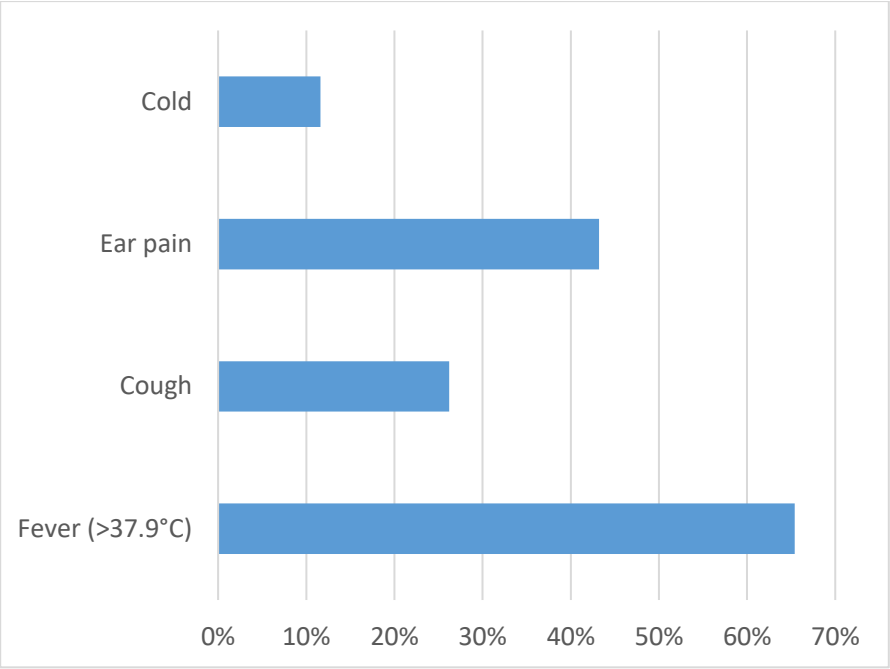
Figure 2 Participants knowledge about antibiotic use to treat upper respiratory tract infections

More than half (57.6%) of the respondents scoring above the mean (4.73 ±1.27) were classified as having good knowledge. Only respondent's education level (p=0.001) and family income (p=0.004) are significantly associated with higher knowledge scores.

Attitude

More than eighty percent had used antibiotics in the last year, 65.4% of respondents believed that the most important symptom to take their children to the pediatrician was fever, followed by ear pain (43.2%), cough (26.2%), and runny nose (58(11.6%) (Fig. 2). Table 2 demonstrates the responses to questions related to attitude. Nearly 90% of the respondents declared that they thought that both parents/carers and pediatricians should be educated about the correct use of antibiotics and only 14.4% of the respondents put pressure on their pediatrician to prescribe antibiotics.

Figure 2 the most important symptom to take their children to the pediatrician



More than half (62.2%) of the respondents scoring above the mean (4.73 ±1.27) were classified as having a good attitude. Only respondent's education level (p=0.04) and family income (p=0.034) are significantly associated with higher knowledge scores.

Table 2 Participants attitude towards antibiotic use to treat upper respiratory tract infections		
Question	Item	Frequency (%
I think parents should get information about the correct use of antibiotics from pediatricians	Strongly disagree Disagree Neutral Agree Strongly agree	10 (2.0) 15 (3.0) 23 (4.6) 171 (34.2) 281 (56.2)
I put pressure on their pediatrician to prescribe antibiotics	Strongly disagree Disagree Neutral Agree Strongly agree	224 (44.8) 93 (18.6) 111 (22.2) 59 (11.8) 13 (2.6)

Practice

More than sixty percent of the respondents declared that they never use antibiotics without consulting a pediatrician. Nearly half (44 %) of the respondents stated that they never asked their pediatrician to prescribe antibiotics, while only 7.4 % of the respondents asked their pediatrician to prescribe antibiotics across the phone. However, only 18 % of respondents stated that their pediatrician told them the diagnosis of their child and that antibiotic administration was necessary. About 66 % declared they exactly follow pediatricians'
directions (Table 3).

Table 3. Participants practice about antibiotic use to treat upper respiratory tract infections		
Question	Item	Frequency (%
How often has your pediatrician told you about the diagnosis of your child's and does he need antibiotics or not?	Never Rarely Sometimes Often Always	30 (6) 82 (16.4) 146 (29.2) 148 (29.6) 94 (18.8)
How often do you think that you follow the pediatrician's advice and instructions?	Never Rarely Sometimes Often Always	5 (1) 21 (4.2) 45 (9) 101 (20.2)) 328 (65.6
How often do you think the pediatrician describes the antibiotic just because you asked him to do so?	Never Rarely Sometimes Often Always	224 (44.8) 93 (18.6 111 (22.2) 59 (11.8) 13 (2.6)
How often have you asked your pediatrician to prescribe an antibiotic through the phone?	Never Rarely Sometimes Often Always	310 (62) 75 (15) 78 (15.6) 28 (5.6) 9 (1.8)

Discussion

The current study assessed knowledge, attitudes and practices on antibiotic use for children in western Libya. The study showed that parents have appropriate knowledge, attitude and practice in the use of antibiotics.

Five hundred respondents were studied, which is comparable to Alrafiaah et al. [24] included 385 respondents in their study, Palestine [25] included 382 parents, while Elbur et al. [26] surveyed 400 participants. The current study indicates that a significant majority of the respondents were mothers, consistent with studies conducted in Saudi Arabia [24, 26, 27] and Palestine [25]. This trend is likely due to the primary caregiving role mothers play in their children's lives. Furthermore, the majority of respondents, regardless of gender, held a college degree similarly in Saudi study [28]. In contrast, a study from Greece [23] found that most respondents were parents with lower educational levels. These discrepancies are not surprising and can be attributed to the different methods used for survey distribution. In the Greece study [6], a school-based stratified geographical clustering

sampling technique was employed. But in the current study, the respondents were approached at clinics caring for children.

One quarter of respondents agreed to use antibiotics in any child with fever. While the rate of agreeing with this statement was nearly three times higher (72.4%) in a study conducted in Jordan [14].

The majority of respondents reported that pediatricians were their primary source of information about antibiotics, followed by pharmacists. This suggests that healthcare professionals, particularly pediatricians, play a central role in shaping parental understanding of antibiotics. This underscores the significant level of confidence and trust that parents/carers place in their relationship with their physicians. However, the relatively low percentage of parents consulting pharmacists suggests an opportunity to improve the role of pharmacists in providing educational resources about the correct use of antibiotics. This is particularly relevant given that pharmacists are often the most accessible healthcare professionals for many parents. This finding in alignment with a study conducted among Greek parents [28], which highlighted the trustful relationship between parents and doctors. Many parents reported being satisfied with the information provided, indicating they would not seek a new pediatrician even if antibiotics were misused. Conversely, only a small number of parents would consider consulting another pediatrician if antibiotics were not prescribed.

Notably, less than half of the respondents recognized that URTIs are predominantly caused by viruses and are self-limited, aligning with findings from Alrafiaah's study (55%) [24] and Alsuhaibani study (44.9%) [28] and a higher percentage was reported in Greek study (80%) [29] that highlighted levels of awareness. This growing understanding among parents is indicative of a positive shift in attitudes, suggesting that they are increasingly refraining from seeking antibiotics as the primary treatment for URTIs. Such awareness is encouraging, as it may contribute to reducing the widespread issue of antimicrobial resistance. A study conducted in Palestine reveals that only 38% of parents refrain from requesting antibiotics for their children, and 6% actively support their pediatricians in avoiding unnecessary antibiotic prescriptions [25]. This highlights significant regional differences in parental attitudes toward antibiotic use.

The study showed that more than 80% of respondents had used antibiotics in the last year. This indicates a prevalent reliance on

antibiotics for treating childhood infections. This is consistent with studies that show antibiotics are frequently used to treat URTIs, despite many of these infections being viral in origin, for which antibiotics are ineffective [1].

The study highlighted some concerning gaps in knowledge among parents regarding the appropriate use of antibiotics. For instance, one quarter of respondents indicated they would administer antibiotics to any child with a fever and the majority of respondents take their child to the pediatrician if they have fever. Fever is a common and non-specific symptom of infection, but it is frequently treated with antibiotics in clinical practice even when the underlying cause is viral [2]. Ear pain and cough were also frequently cited as reasons for pediatric consultations, which aligns with the typical symptoms of URTIs. Interestingly, runny nose was less commonly reported as a reason for seeking care. This pattern reflects parental perceptions of symptoms that they associate with more severe illness or infections that might require antibiotics. The discrepancy between fever, ear pain, and other mild symptoms like a runny nose suggests that parents may perceive some symptoms as more indicative of bacterial infections that require antibiotic treatment, even though many such symptoms are typically associated with viral infections [3].

Regarding attitudes toward antibiotic use, about two-third of respondents agreed that antibiotics are overused, which is a positive sign of increasing awareness about the risks of unnecessary antibiotic prescriptions. This in turn,the vast majority of respondents felt that both parents/carers and pediatricians should be educated about appropriate antibiotic use. This suggests a recognition that education is a shared responsibility, and that both parents and pediatricians play an important role in curbing inappropriate antibiotic use. Interestingly, only few of respondents reported putting pressure on their pediatrician to prescribe antibiotics, which suggests that while some parents may be inclined to request antibiotics, most are willing to trust their pediatrician's judgment [4].

A large majority of respondents, specifically more than sixty percent, indicated that they would never use antibiotics without consulting a pediatrician. This suggests a strong reliance on professional guidance, which is crucial in preventing antibiotic misuse and resistance [6]. Interestingly, nearly half (44%) of the respondents reported that they never requested antibiotics from their pediatricians, which suggests a

relatively high level of trust in the medical professional's judgment when it comes to antibiotic prescribing practices. This is encouraging as studies have shown that patient or caregiver-driven requests for antibiotics, even in cases where they are not clinically warranted, can contribute to the overuse and subsequent resistance of antibiotics [7]. The fact that only 7.4% of respondents requested antibiotics over the phone may reflect a preference for in-person consultations, allowing pediatricians to properly evaluate the need for antibiotics based on clinical signs and symptoms, a practice that aligns with guidelines for responsible antibiotic prescribing [8].

On the other hand, only 18% of the respondents reported that their pediatricians explicitly communicated the diagnosis and the need for antibiotics. This low percentage could indicate a potential gap in communication or understanding between healthcare providers and parents. Clear and transparent communication about diagnosis and treatment plans is essential for both compliances with medical advice and the prevention of unnecessary antibiotic prescriptions. It is known that when healthcare providers take the time to explain the rationale behind treatment decisions, patients and caregivers are more likely to adhere to guidelines, reducing the potential for misuse [8].

Regarding adherence to pediatricians' advice, the majority of respondents reported that they exactly follow the pediatricians' directions. This suggests that while the majority of caregivers comply with medical advice, there is still a notable portion who may not fully follow recommendations. Factors that may influence non-adherence include misunderstanding of instructions, lack of time, or insufficient trust in medical advice [31]. It would be beneficial to explore these barriers in future research to improve adherence rates and enhance the effectiveness of pediatric care.

Also, more than half of the respondents who scored above the mean were classified as having good knowledge about the appropriate use of antibiotics to treat upper respiratory tract infections (URIs). However, while many respondents exhibited a good level of knowledge and attitude, there was variability in the level of understanding, which can be attributed to specific demographic factors. Education level and family income were found to be significantly associated with higher knowledge and attitude scores, respectively. This significant association underscores the importance of socioeconomic factors in shaping health literacy. These findings are consistent with previous

studies that indicated that individuals with higher levels of education are more likely to have critical thinking skills, and better understanding of medical issues, including the appropriate use of antibiotics [29, 30]. This is because individuals with higher educational attainment are often exposed to more information about health risks and the consequences of inappropriate antibiotics. Therefore, educational interventions focusing on improving awareness about antibiotic stewardship could be particularly effective in populations with lower levels of education. People from higher-income backgrounds may have greater access to healthcare professionals, therefore, they can get accurate guidance about when and how antibiotics should be used, thus reducing the likelihood of misuse [30].

In conclusion, this study demonstrates that while the majority of respondents are educated, there are some gaps in their knowledge regarding the use of antibiotics for treating URTIs in children. These gaps can lead to inappropriate attitudes and practices. Key factors contributing to these issues include respondents' tendency to self-prescribe antibiotics and their tendency to seek out doctors who will prescribe antibiotics, even when they may not be necessary.

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