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PARENTAL KNOWLEDGE AND ATTITUDES TOWARD ANTIBIOTIC USE IN CHILDREN WITH UPPER RESPIRATORY INFECTIONS

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ABSTRACT

Background: Most upper respiratory tract infections (URTIs) in children are viral, yet antibiotics are often prescribed unnecessarily, contributing to rising antimicrobial resistance worldwide. Parental expectations, anxiety, and self-medication practices play a key role in inappropriate antibiotic use, while physician prescribing is often influenced by parental pressure.

Materials and Methods: A cross-sectional study was conducted in four Primary Health Centres (PHCs) between January–May 2025, covering rural, semi-urban, and urban areas through geographic clustering. The study targeted parents aged 18–50 years with children attending PHCs. Using Raosoft calculator with 50% response distribution, 5% margin of error, and 95% CI, the required sample size was 377, increased to 400 to account for non-response. Convenience sampling was adopted for feasibility. Data were collected using a structured, self-administered questionnaire adapted from validated studies. Content validity was ensured by experts in paediatrics, infectious diseases, pharmacy, and biostatistics, and a pilot study (n=30) tested clarity. The final questionnaire included four sections: demographics, knowledge, attitudes, and practices regarding antibiotic use. Items assessed parental awareness, expectations, perceptions of antibiotic effectiveness, symptoms prompting consultation, and physician–parent communication regarding antibiotic prescriptions.

Results: A total of 400 parents participated (response rate 100%), with a mean age of 34.6 ± 7.8 years; mothers comprised 62.5%. Participants were from rural (42%), semi-urban (33%), and urban (25%) areas. Education levels showed 28% with primary, 40% with secondary, and 32% with university or higher education; 46% reported low income, 38% moderate, and 16% high income. Health insurance was present in 72% of families, and 14% reported a child with chronic illness, mainly asthma. Knowledge levels were limited: 47% correctly identified ≥4 antibiotics, 62% knew they act on bacteria, but 58% wrongly thought they help viral infections; 69% were aware of side effects. Physicians (54%) were the main information source, followed by pharmacists (26%) and internet/social media (20%). Attitudes were suboptimal: 45% expected antibiotics for URTIs, 64% believed they hasten recovery, and 30% preferred supportive care. Practices included self-medication (28%), mostly due to urgency (41%) or financial/time constraints (32%). Overall, 42% had poor knowledge, 55% displayed inappropriate attitudes, and 30% reported inappropriate practices such as self-medication, pressuring doctors, or incomplete courses.

Conclusion: This study demonstrates inadequate knowledge, inappropriate attitudes, and concerning practices regarding antibiotic use among parents. Strengthening parental education, enforcing prescription regulations, and enhancing physician–parent communication are critical steps toward promoting rational antibiotic use and reducing antimicrobial resistance.

Keywords: Antibiotic misuse, Parental knowledge, Antimicrobial resistance.

INTRODUCTION

Physicians frequently treat children with upper respiratory tract infections (URTIs) in primary health care facilities.[1] These diseases are thought to be the primary reason why kids miss school or parents miss work. Additionally, parents and the healthcare system face a huge financial burden due to these diseases in children.[2] In its final report published in April 2014, the World Health Organization stated that antibiotic resistance is a significant and expanding worldwide issue.[3] The connection between antibiotic use and the emergence of resistance has been documented in a number of research.[4] Antibiotic resistance is most prevalent in nations with the highest antibiotic consumption.[5] Even though most URTIs are caused by viruses,[6] pediatricians frequently prescribe antibiotics to treat URTIs.[7] 20–50% of all antibiotic use is probably medically unnecessary. The primary cause of the emergence of antibiotic resistance is improper antibiotic prescription.[8]

Parents and pediatricians are the primary causes of children's resistance development. When it comes to prescribing antibiotics, parental expectations and attitudes play a significant role. Parental anxiety over acute infections increases the number of pediatric doctor visits for URTIs and, consequently, the use of unneeded antibiotics.[9] As a result, several studies have assessed the variables associated with antibiotic misuse. These elements include expertise, views and convictions about the use of antibiotics, actions, patient satisfaction with therapy, communication between patients and doctors, and patient experiences with antibiotics. An essential component of sensible antibiotic usage and, thus, reducing the emergence of antibiotic resistance is appropriate public awareness and attitude toward antibiotics.[10] Regrettably, one of the main reasons doctors prescribe antibiotics for viral URTIs is the pressure they have to live up to patient expectations. As a result, parental awareness, attitudes, and behaviors about the use of antibiotics for URTIs in their children are extremely valuable.[11] Antibiotic abuse and buying antibiotics without a prescription have been the subject of numerous investigations. These investigations assessed patterns of parenteral antibiotic prescription among pediatric hospitalized patients, the amount of antibacterial agent storage and waste in households, and antibiotic self-medication.[12] Parents' knowledge, attitudes, and practices (KAP) on the use of antibiotics for pediatric URTIs were not evaluated in either of these trials or any other research that was done. This study provides baseline information for creating instructional initiatives for local health authorities.

MATERIALS AND METHODS

Study area and study design: A cross-sectional study was conducted in our Primary Health Centre between Jan 2025 to May 2025. To get a representative sample of parents, the PHC center was chosen using geographic clustering sampling. The majority of previously published research on antibiotic knowledge and attitudes has focused on doctors working in primary care facilities. Four primary healthcare facilities were selected for this investigation. They serve a sizable patient base, offer a comprehensive range of primary healthcare services, and serve to the three different community types in this area (rural, semi urban and urban centres). As far as we are aware, very few researches of this kind have been done on parents or other customers.

Study population: The study population were the parents of children attending PHC centres aged between 18 and 50 years.

Sampling procedure and sample size calculation

A Raosoft sample size calculator was used to determine the sample size. A 50% response distribution, a 5% margin of error, and a 95% confidence interval served as the basis for the computation. Since there are no prior published comparable studies, it was assumed that the response rate was 50% and that neither the responses nor the response rates were known. 377 was the estimated sample size. The sample size was raised to 400 in order to adjust for any missing data or non-response rate and guarantee accuracy. In the end, convenience sampling was used to choose parents since it saves the researchers money, time, and effort.

Data collection procedure: After examining relevant research, a self-administered questionnaire was created. The majority of the questions were adapted to fit the local context and ensure their applicability by taking elements from previously published, verified studies.[13]

The questionnaire is divided into four primary sections: participant demographic information; knowledge, attitudes, and practices about antibiotic usage; and more. A panel of professionals with backgrounds in pediatrics, infectious diseases, clinical pharmacy, and biostatistics guaranteed the questionnaire's content validity. Thirty people participated in a pilot study to assess the questionnaire's readability and clarity. The questionnaire's final draft was improved and adjusted in response to participant input. There were four sections in the final questionnaire: A, B, C, and D. Demographic information, such as age, gender, income, number of children, residency, education levels, health insurance status, and whether the child had a chronic illness like asthma, was included in Section A. Items pertaining to parental knowledge of antibiotics were added in Section B, which was taken from Panagakou et al.[13] In addition to answering questions about the general usage of antibiotics, their side effects, and their use in viral infections, parents were asked to mark the names of six commonly used drugs. Additionally, Section B looked into information sources about antibiotic use. Items pertaining to parental opinions toward antibiotics were included in Section "C." In order to manage pediatric URTIs, parents were asked about potential

therapy alternatives. Furthermore, parents were specifically questioned regarding the most severe symptoms that would need to exist for them to visit the pediatrician's office. Additional inquiries inquired about parents' perceptions of the effectiveness of antibiotics in treating a range of illnesses. Additionally, parents were asked to specify the reasons for using antibiotics without medical advice as well as their expectations for using them in relation to URTI symptoms. Lastly, Section D included examples of how parents responded to inquiries about the medical practice. Parents were questioned if their pediatrician spends enough time explaining a kid's sickness and recommending antibiotic treatment, as well as whether their urge to prescribe antibiotics for their child affects them. On a 5-point Likert scale, parents were asked to respond to the following statements: "strongly agree," "agree," "uncertain," "disagree," "strongly disagree," or "never," "sometimes," "often," "most of the time," and "always."

Statistical analysis: The Statistical Package for the Social Sciences (SPSS), version 17.0 for Windows, was used to enter and evaluate the data. Descriptive quantitative statistics, such as frequency and percentage for categorical variables and means ± standard deviation (SD) or medians (lower upper quartiles) for numerical variables, were used to analyse the responses to the questions. The Microsoft® Office Excel 2007 was used to make the figures.

RESULTS

A total of 400 parents participated in the study, giving a response rate of 100%. The mean age of respondents was 34.6 ± 7.8 years, ranging from 18 to 50 years. The majority of participants were mothers (62.5%), while fathers accounted for 37.5%. Regarding place of residence, 42% were from rural areas, 33% from semi-urban areas, and 25% from urban centers. In terms of educational status, 28% of parents had completed primary school, 40% had completed secondary school, and 32% held a university degree or higher. With respect to income, 46% reported a low household income, 38% reported a moderate income, and 16% reported a high income. The median number of children per family was three (IQR: 2–4). A majority of parents (72%) reported having health insurance coverage. Additionally, 14% of parents indicated that at least one of their children had a chronic illness, most commonly asthma [Table 1].

Table 1: Sociodemographic Characteristics of Participants (n = 400)

Characteristic	Category	n (%)
Parent	Mother	250 (62.5)
	Father	150 (37.5)
Age (years)	Mean ± SD	34.6 ± 7.8
Residency	Rural	168 (42.0)
	Semi-urban	132 (33.0)
	Urban	100 (25.0)
Education	Primary school	112 (28.0)
	Secondary school	160 (40.0)
	University or higher	128 (32.0)
Household income	Low	184 (46.0)
	Moderate	152 (38.0)
	High	64 (16.0)
Health insurance	Yes	288 (72.0)
Child with chronic illness	Yes	56 (14.0)

Knowledge levels varied considerably among the participants. Only 47% of parents were able to correctly identify at least four out of six commonly used antibiotics. With regard to indications, 62% of parents correctly recognized that antibiotics are effective against bacterial infections; however, 58% incorrectly believed that antibiotics are also useful for viral infections such as the common cold and influenza. Awareness of potential adverse effects was relatively high, with 69% of parents acknowledging that antibiotics may cause side effects such as diarrhoea, allergy, or antimicrobial resistance. When asked about their main sources of information on antibiotic use, the majority of parents cited physicians (54%), followed by pharmacists (26%) and social media or internet sources (20%) [Table 2].

Table 2: Parental Knowledge of Antibiotics

Knowledge Indicator	n (%)
Correctly identified ≥4 antibiotics	188 (47.0)
Knew antibiotics treat bacterial infections	248 (62.0)
Incorrectly believed antibiotics treat viral infections	232 (58.0)
Aware of antibiotic side effects	276 (69.0)
Sources of information	
Physician	216 (54.0)
Pharmacist	104 (26.0)
Internet/social media	80 (20.0)

Overall, parental attitudes reflected a tendency toward inappropriate expectations regarding antibiotic use. About 45% of parents expected antibiotics for the treatment of paediatric upper respiratory tract infections (URTIs), particularly for symptoms such as sore throat and cough, while only 30% preferred supportive care measures. A majority of parents (64%) agreed or strongly agreed that antibiotics are effective in speeding recovery from common cold symptoms.

When asked about symptoms that would prompt them to seek a paediatric consultation, the most frequently reported were fever greater than 38.5°C, persistent cough, and ear pain. Self-medication with antibiotics was also reported, with 28% of parents admitting to using leftover antibiotics or purchasing them without a prescription. The most common reasons cited for this practice were a perceived urgency of the illness (41%) and financial or time constraints (32%) [Table 3].

Table 3. Parental Attitudes Toward Antibiotics

Attitude Indicator	n (%)
Expected antibiotics for URTI symptoms	180 (45.0)
Perceived antibiotics effective in cold recovery	256 (64.0)
Used antibiotics without prescription	112 (28.0)
Main reasons for self-medication	
Perceived urgency of illness	46 (41.0)*
Financial/time constraints	36 (32.0)*

More than half of the parents (57%) agreed that paediatricians usually spent sufficient time explaining their child's illness and the treatment plan, while 22% disagreed with this statement. Nearly 40% of parents acknowledged that their own requests or insistence sometimes influenced paediatricians to prescribe antibiotics. Nevertheless, the majority (68%) reported that they generally trusted and followed the physician's decision, even when antibiotics were not prescribed [Table 4].

Table 4: Interaction with Healthcare Providers

Indicator	n (%)
Physician spends adequate time explaining illness/treatment	228 (57.0)
Parents influencing doctors to prescribe antibiotics	160 (40.0)
Parents following physician's decision even without antibiotics	272 (68.0)

When composite scores were analysed, 42% of parents demonstrated poor knowledge of antibiotic use, 38% showed a moderate level of knowledge, and only 20% achieved a good knowledge score. In terms of attitudes, more than half of the participants (55%) displayed inappropriate attitudes toward antibiotic use in children. Regarding practices, 30% of parents admitted to engaging in at least one inappropriate behaviour, such as self-medicating their child with antibiotics, pressuring physicians to prescribe them, or not completing the full course of treatment [Table 5].

Table 5: Composite KAP Scores

Domain	Category	n (%)
Knowledge	Poor	168 (42.0)
	Moderate	152 (38.0)
	Good	80 (20.0)
Attitude	Inappropriate attitudes	220 (55.0)
Practice	Inappropriate practices	120 (30.0)

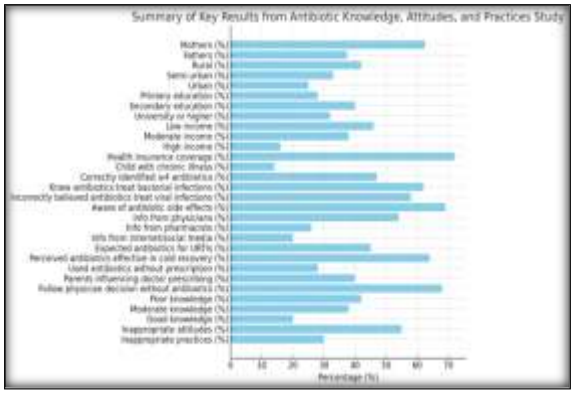

Figure 1: A summary table of the results and a horizontal bar chart to visually represent the findings.

DISCUSSION

This study assessed parental knowledge, attitudes, and practices (KAP) regarding antibiotic use in children attending primary healthcare centers. The findings highlight significant gaps in knowledge, inappropriate expectations regarding antibiotics for viral infections, and suboptimal practices such as self-medication and pressuring physicians to prescribe antibiotics.

The sociodemographic profile of the participants revealed that most respondents were mothers, consistent with earlier studies where mothers are typically the primary caregivers and decision-makers in child health.[14] The educational distribution and income levels observed in this study also reflect the broader population attending primary healthcare centers in low- and middle-income countries.[15]

Regarding knowledge, less than half of the parents could correctly identify commonly used antibiotics, and a considerable proportion (58%) incorrectly believed that antibiotics are effective against viral infections. These findings are consistent with studies

from Greece,[11] Saudi Arabia,[14] and Jordan,[15] where parental misconceptions about the role of antibiotics in viral illnesses such as the common cold were widespread. Awareness of antibiotic side effects was higher in our study (69%) compared to some previous reports, suggesting gradual improvement in awareness, possibly due to public health campaigns. Nevertheless, the persistence of misconceptions underscores the need for targeted educational interventions.

Parental attitudes showed a strong expectation for antibiotic use in managing pediatric upper respiratory tract infections (URTIs), with 45% of parents demanding antibiotics for symptoms such as cough and sore throat. Similar findings have been documented in Palestine,[16] India,[17] and Turkey,[18] where parental pressure significantly influenced prescribing patterns. Importantly, 64% of parents in our study believed antibiotics accelerated recovery from the common cold, a belief that contributes to inappropriate demand for antibiotics.

Self-medication with antibiotics, reported by 28% of parents, is a major concern. This rate is comparable to findings in Egypt,[19] and higher than reports from European countries where stricter regulations exist.[20] The most common reasons cited—perceived urgency and financial/time constraints—suggest barriers in healthcare accessibility. These findings emphasize the importance of enforcing prescription-only regulations and improving healthcare system efficiency.

Physician–parent interactions revealed that while most parents trusted physicians' decisions, nearly 40% admitted to influencing antibiotic prescribing. Previous studies have also shown that parental insistence is a key determinant of unnecessary prescriptions.[21,22] This highlights the need for healthcare professionals to adopt strong communication strategies and resist non-evidence-based prescribing pressure.

The composite KAP scores indicated that a significant proportion of parents (42%) had poor knowledge, more than half (55%) had inappropriate attitudes, and nearly one-third (30%) engaged in inappropriate practices. These results are consistent with similar KAP studies in Asia and the Middle East,[23] confirming that irrational antibiotic use among parents remains a global public health issue.

Limitation: This study has several strengths, including a representative sample from rural, semi-urban, and urban populations and the use of a validated questionnaire adapted to local context. However, limitations should be acknowledged. Convenience sampling may introduce selection bias, and the self-reported questionnaire format may be subject to recall or social desirability bias. Despite these limitations, the findings provide valuable insights into parental behaviour toward antibiotics contribute to the limited literature available on this population.

CONCLUSION

In conclusion, the study highlights inadequate knowledge among parents regarding antibiotic use. A large proportion demonstrated inappropriate attitudes toward pediatric URTI management. Concerning practices such as self-medication and incomplete antibiotic courses were common. These behaviors contribute to the growing problem of antimicrobial resistance. Strengthening parental education on appropriate antibiotic use is urgently needed.

Strict enforcement of prescription-only regulations can curb misuse.

Enhanced physician–parent communication may reduce unnecessary antibiotic demand.

Together, these measures can promote rational antibiotic use and safeguard child health.

Conflict of interest

The authors declare that they have no conflicts of interest.

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