Original Article

Parents' Management of Acute Upper Respiratory Tract Infections in Children, Al Ahsa, Saudi Arabia

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Abstract

Introduction: Although upper respiratory tract infections (URTIs) are usually self-limiting and numerous off-the-counter medications used have no effect on outcome (2), self-medication is quite common in the pediatric population, posing a great risk of inappropriate use and subsequently increasing the risk for mistreatment and adverse effects.

Purpose: This study aims to comprehensively investigate the prevalence, practices, and factors associated with medicine use in the management of symptoms of acute URTIs in children aging 12 years or younger in Al Ahsa, Kingdom of Saudi Arabia.

Methods: This is a cross-sectional study conducted among 344 randomly selected children. Data were collected from their caregivers using an online-based, self-administered questionnaire.

Results: 65% of children had 1–3 episodes of URTI per year, followed by 24% who had 4–6 episodes per year. Although 13% of parents had no idea what their child was going through, 72% of children received treatment for these symptoms, in which 77% were prescribed by the doctor, followed by 16% guardian suggestion and 14% pharmacist. The treatment given was 76% antipyretics, 39% antibiotics, 34% decongestant, and 26% cough suppressants and antihistamines. The majority (79%) children took the correct dose for full duration; however, 20% did not. 50% of participants used more than one medicine at one time to treat their children URTI. Most of the children (91%) improved on using the medicines prescribed. 79% of parents are aware of the risks associated with taking drug without prescription and 91% consider that certain drugs should not be given to children. Surprisingly, 94% would take their child to doctor if they develop URTI, but 34% will advise a relative/friend to use certain treatments.

Conclusion: The results obtained indicate good parents' knowledge and practice regarding proper management of URTIs for the majority of participants.

Key words: Al Ahsa, Children, Parents, Saudi Arabia, Self-medication, Upper respiratory tract infections

INTRODUCTION

Upper respiratory tract infections (URTIs) are one of the most commonly encountered diseases in both pediatric and adult populations.[1] Although URTIs are rarely fatal, they compose a great economic burden on health systems.[2] 20–30% of all hospital admissions and 30–60% of practitioner visits in the developing countries are related to respiratory tract infections.[3-5] URTIs have a high cost to society, leading to unnecessary absence from school and unnecessary medical care.[1]

Although URTIs are usually self-limiting and numerous off-the-counter medications used have no effect on outcome,[2] self-medication and use of medicines without a prescription are quite common.[6-8] Self-medication is the taking of drugs, herbs, or home remedies on one's own initiative, or on the advice of another person, without consulting a doctor, as traditionally defined.[9] Common sources of self-medication include friends, families, pharmacists, or even previously prescribed drugs.

When it comes to pediatric population, such decision is made by the caretaker and it is primarily influenced by

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parents' knowledge, believes, and attitude toward self-medication. Unfortunately, medicines used for disease management in pediatrics are commonly obtained without a prescription, posing a great risk of inappropriate use, and subsequently increasing the risk for mistreatment and adverse effects.[10]

Since most published studies in the Kingdom of Saudi Arabia exclusively assessed antibiotics use and the role of parents' in the management,[11-12] this study aims to comprehensively investigate the prevalence, practices, and factors associated with medicine use in the management of symptoms of acute URTIs in children aging 12 years or younger in Al Ahsa, Kingdom of Saudi Arabia.

METHODS

Study Type
This is a cross-sectional study conducted in Al Ahsa, Saudi Arabia, from Dec 1, 2017, to May 1, 2018.

Study Size and Population
A total of 344 parents of neonates, infants, and children from birth to 12 years old, who have a history of at least one episode of acute upper respiratory tract infection during their lifetime, were selected. Exclusion criteria include (1) children older than 12 years and (2) children having comorbidities that interfere with the parents' management of acute upper respiratory tract infection.

The sample size for the study was calculated through Open Source Epidemiologic Statistics for Public Health using $[DEFF*Np(1-p)]/[(d2/Z21-\alpha/2*(N-1)+p*(1-p)]$ formula. It was estimated that 344 patients will be needed for the study. The prevalence of URTI was taken from a previous study[13] with 95% confidence level, z corresponding to two-tailed significance level 1.96, and marginal error of 0.05.

Data Collection
The data were measured using a self-administered web-based questionnaire. The questionnaire is based on Ocan *et al*.[14] study, which initially derived their questionnaire from the literature review and from articles by Morgan *et al*.[15] and Ocan *et al*.[16] and then further modified using the outcome of the pre-test. The study has three main measures which are: (1) Parent sociodemographic data, (2) children sociodemographic data and medical history, and (3) medicine use practice in the management of acute upper respiratory tract infection. The questionnaire was supplemented by new items not present in the original questionnaire (14), for suitability for the region, religion and culture in the area.

Statistical Analysis
Statistics were performed using the IBM SPSS Statistics version 22.0 software. Quantitative variables were presented as mean and standard deviation and number with a percentage for qualitative variables. For correlation with categorical variables, Chi-square test was used with the results presented in crosstabs tables and clustered bar graphs and *t*-test or one-way ANOVA for correlation with continuous variables, with the result presented in tables. *P* value of <0.05 was considered as statistically significant.

Ethical Statement
Ethical clearance was obtained from King Faisal University Research Ethics Committee. Written informed consent was obtained as well from the participants in the introduction web page before involvement in the study.

RESULTS

The results suggest that majority (37%) of the participants were between age 26 and 33 years followed by 29% who belonged to the age group of 34–41 years as shown in Table 1. More than half of the participants (60%) were females followed by 40% of males. Almost all the participants were Muslims and majority were married (96.5%). 29% of participants had more than 4 children followed by 24% who had 2 children, 23% who had 3 children and 23% who had 1 child only. 68% of the participants belonged to the urban area followed by 32% belonging to rural. Approximately 66% of the subjects had completed their graduation and 27% were secondary pass. However, 40% of them were unemployed and 32% were government employees. Majority of the participants had medium socioeconomic status followed by 12% belonging to lower class. Majority (83%) of them did not have any chronic illness.

Regarding demographics of a child, majority (53%) of them were between age 1 and 3 years, followed by 17% belonging to 4–8 years and 11% belonging to 9–12 years of age. Approximately 58% were male children and 42% were female children. However, 53% population of children in the study were the first child in their family and 65% at least have 1–3 episode of URTI per year, followed by 24% who have 4–6 episodes per year. Majority of the children (85%) were carrier of sickle cell disease with no chronic illness at all. Vaccine coverage was done in 94% of the children; however, 6% were not vaccinated.

Table 2 suggests the reported disease condition which was most common in the study population. Approximately 66% of children have cough, 61% had runny nose along with fever, and 45% had nasal blockage. The most probable cause for these symptoms as per perceived by parents was

Table 1: Demographics

Demographics	n (%)
Age of parent	
18–25 years	50 (14)
26–33 years	127 (37)
34–41 years	101 (29)
More than 41 years	66 (19)
Gender of parent	
Male	138 (40)
Female	206 (60)
Religion	
Muslim	343 (100)
Non-Muslim	1
Marital status	
Single	5 (1.5)
Married	332 (96.5)
Divorced	4 (1.2)
Widow	3 (0.9)
Number of children	
1	81 (23)
2	83 (24)
3	80 (23)
≥4	100 (29)
Residence	
Urban	233 (68)
Rural	111 (32)
Level of education	
Primary	3 (1)
Elementary	20 (6)
Secondary	93 (27)
Graduate	226 (66)
Occupation	
Student	32 (9)
Government employee	110 (32)
Private employee	65 (19)
Unemployed	137 (40)
Socioeconomic status	
Low	43 (12)
Medium	286 (83)
High	15 (4)
Chronic illness	
Yes	60 (17)
No	284 (83)
Age of child	
<1–3 years	142 (53)
4–8 years	133 (17)
9–12 years	69 (11)
Gender	
Male	198 (58)
Female	146 (42)
Ranking	
First child	181 (53)
Second child	58 (17)
Third child	37 (11)
Fourth and beyond	68 (20)
Episodes of acute upper respiratory tract infections per year	
1–3	223 (65)
4–6	82 (24)
7–9	24 (7)
10 or more	15 (4)
Sickle cell anemia	
Affected	14 (4)
Carrier	293 (85)
Not affected	37 (11)
Chronic illness	
Yes	294 (15)
No	50 (85)
Vaccine	
Yes	323 (94)
No	21 (6)

Table 2: Reported disease conditions of the children

Question	Description of answer	Proportion (%)
Symptoms the child usually have?	Runny nose	211 (61)
	Nasal blockage	156 (45)
	Sneezing	123 (36)
	Cough	229 (66)
	Throat pain	136 (39)
	Difficulty swallowing	70 (20)
	Fever	211 (61)
	Malaise	92 (27)
	Loss of appetite	114 (33)
	Rapid breathing	34 (10)
	Phlegm	134 (39)
The most probable cause for these symptoms is?	Common cold	260 (75)
	Rhinitis	45 (13)
	Pneumonia	24 (7)
	Asthma	30 (9)
	Rhinosinusitis	1 (1)
	I do not know	44 (13)
Does the child receive treatment for the symptoms?	Yes	248 (72)
	No	93 (27)
	I do not know	4 (1)
If yes, who recommend this treatment?	Guardian	57 (16)
	Doctor	265 (77)
	Pharmacist	48 (14)
	Family/friends	9 (3)
	Websites	7 (2)
	Social media	2 (1)
	Other	42 (12)
What medicine does the child receive?	Antihistamine	89 (26)
	Antipyretic	264 (76)
	Decongestant	119 (34)
	Cough syrup	90 (26)
	Anti-phlegm	88 (25)
	Amoxicillin	136 (39)
	Azithromycin	
	Trimethoprim	
	Other	14 (4)
From where you get the medicine?	Pharmacy	91 (26)
	Hospital	281 (81)
	Herbal remedy	1 (1)
	Home pharmacy	22 (6)
	Home remedy	6 (2)
	Family/friends	1 (1)
	Other	16 (5)

common cold (75%) followed by 13% rhinitis, and 13% of parents had no idea what their child was going through. However, 72% of children received treatment for these symptoms and 77% were prescribed by the doctor, followed by 16% guardian suggestion and 14% by pharmacist. The treatment given was 76% antipyretics, 39% antibiotics, 34% decongestant, and 26% cough suppressants and antihistamines.

The practice for drug use is summarized in Table 3, and the results suggest that majority (79%) children took the correct dose for full duration; however, 20% did not take proper dose of the prescribed medicine. Approximately 32% of participants discarded the leftover drug and 21% kept it as

left over. 50% of participants used more than one medicine at one time to treat their children URTI. Most of the children (91%) improved on using the medicines prescribed. 79% of parents are aware of the risks associated with taking drug without prescription, and 91% consider that certain drugs should not be given to children. Surprisingly, 94% would take their child to doctor if they develop URTI, but 34% will advise a relative/friend to use certain treatments.

For the association between demographic factors and drug use, age was significant ($P = 0.01$) for one components of 9 questions [Table 4]. Similarly, level of education had also shown significance toward one question $P = 0.03$.

Regarding marital status, two questions showed significant values, i.e., did the child receive more than one medicine at one time ($P = 0.04$) and would you advise a relative/friend to use certain treatments ($P = 0.02$). Whereas, occupation was significantly associated with three components, i.e., did you know the risks of taking drug without prescription in children ($P = 0.00$), do you think some medicines should not be used for children ($P = 0.01$), and would you advise a relative/friend to use certain treatments ($P = 0.00$).

DISCUSSION

Kunin *et al.* defined self-medication as self-administering inadequate doses of non-prescription medicines before doctors' diagnosis.[17] Bi *et al.* found that the act of self-medication may lead to negative consequences to the child such as growth retardation, drug resistance, and unbalanced bacteria distribution.[18] Previous studies have been done to evaluate the extent of self-medication by parents to their children. Akici *et al.*, in Turkey, found that approximately 60% of parents had self-medicated their children before doctor visit.[19] Likewise, Bi *et al.* found that 59% of children in China had been self-medicated by their parents.[18] Moreover, Grigoryan *et al.* found that acute URTIs were the most common reason in Europe for parent's self-medication to their children.[20] Self-medication is an important issue in Saudi Arabia[21] and several adjacent countries such as Iran,[22] Jordan,[23,24] and Sudan.[25] In our study, 72% of children received treatment for acute upper respiratory tract infection symptoms, of which 77% were prescribed by the doctor, followed by 16% guardian suggestion and 14% by pharmacist. Similarly, Alrafiaah *et al.* assessing Saudi parent's awareness of antibiotics role in upper respiratory tract infection in children reveal that the majority of parents identified their physicians as being their main source of information regarding antibiotic use,[12] as well as Rouusounides *et al.*,[26] which stated that most of the parents acknowledged their pediatrician as the main source of information regarding use and misuse of antibiotics, showing parent's trust and confident in their doctors regarding their children health. Furthermore, Alrafiaah *et al.* stated that some participants would use antibiotics based on pharmacists' recommendations.[12] Similarly, a Greek study showed that a substantial proportion of antibiotic outpatient use is attributed to over-the-counter purchase, while in another study involving pharmacists, it

Table 3: Drug use practices in the treatment of illnesses in children in household

Statements	Yes (%)	No (%)
The child takes the medicine in the correct dose and for full duration	260 (79)	70 (20)
Discard left over medicine	110 (32)	72 (21)
The child receives more than one medicine at one time?	162 (50)	162 (50)
Child improved on the medication	301 (91)	29 (9)
What did you do when child did not improve?		
Consult doctor	4 (1)	
Change medicines	1 (1)	-
Used same medicine	2 (1)	
Herbal remedies	2 (1)	
Other	335 (97)	
Do you know the risks of taking drug without prescription in children?	273 (79)	71 (21)
Risks associated with drug without prescription		
Drug overdose	23 (7)	
Complications	79 (23)	-
Fatigue	7 (2)	
Kidney failure	9 (3)	
Allergy	19 (5)	
Drug resistance	8 (2)	
GI disturbance	6 (2)	
Drug interaction	1 (1)	
Do you think some medicines should not be used for children?	313 (91)	31 (9)
Can you name some of the medicine that should not be used for children?	109 (32)	235 (68)
If the child has symptoms of upper respiratory tract infection in the future, would you like to visit a doctor	324 (94)	20 (6)
Would you advise a relative/friend to use certain treatments?	119 (34)	225 (65)

Table 4: Association between demographic factors and drug use

Age* drug use	Yes	No	*P* value
Would you advise a relative/friend to use certain treatments?	119	225	0.01
Marital status* drug use			
Did the child receive more than one medicine at one time?	162	162	0.04
Would you advise a relative/friend to use certain treatments?	119	225	0.02
Level of education* drug use			
Left over medicine discarded	110	72	0.03
Occupation* drug use			
Did you know the risks of taking drug without prescription in children?	273	71	0.00
Do you think some medicines should not be used for children?	313	31	0.01
Would you advise a relative/friend to use certain treatments?	119	225	0.00

was illustrated that over-the-counter purchase of antibiotics is easy.[26]

Parent's knowledge, attitude, and behavior toward self-medication may show a significant variation in terms of geographical locations, social behaviors, cultural factors, and demographics such as age, educational level, employment, and marital status, all of which have been previously identified by other studies as important factors related to parent's self-medication and antibiotic consumption. Likewise, a recent study illustrates the significant association between demographics and parents KAPs toward management of symptoms of URTIs,[26] in which older parental age and educational level significantly correlated with correct parental knowledge, attitudes, and practices on wise use of antibiotics during childhood URTI's. On the other hand, Bi *et al.* studied Chinese parent's self-medication and concluded that mothers with higher level of education are more likely to self-medicate their child, parental self-medication usually increases with the age of the child, and severity of disease was related to parental self-medication (i.e., when the diseases were not serious self-medication and antibiotics misuse are more likely to occur).[18] Our results were in concordance with the study of.[26] However, in which people with lower level of education had a tendency toward keeping drugs left over (66.77% of participants with primary school education compared to 22.1% of college degree holders), suggesting that people with higher level of education have a better practice toward leftover drug. Moreover, our study shows that 70.8% and 75.7% of the study population aging between 26 and 33 years of age and people aging more than 41 years, respectively, will not advice friends neither relatives of using certain treatment for their children to treat an URTI signifying a healthier practice as compared to other age groups.

Moreover, in our study, occupation was found to be significantly associated with parents' KAPs toward management of acute upper respiratory tract infection in their children, in which our results suggest that the privet sector employees are the least knowledgeable about risks of using non-prescription drugs and drugs that should not be used in children.

Our study reveals that most common treatments given by parents to treat their child's illness were antipyretics (76%), antibiotics (39%), decongestant (34%), and cough suppressants and anti-histamines (26%). Ocan *et al.* study had similar outcomes for the use of antibiotics in treating acute URTIs in children accounting for 44.8%. Another study shows that 67.3% of the study population expected that the possible treatment suggested by the pediatrician for URTI in children would be antipyretics and analgesics, and 60.5% also chose antibiotics as the treatment that they anticipated would be recommended by their pediatrician. This can explain parents' choice of these medications to self-medicate their children.[12]

Furthermore, Sorkhou *et al.* conducted a study in Kuwait to assess the factors encouraging the antibiotic misuse and found that physicians feel obliged to prescribe antibiotics to their patients assuming the patients' or guardians' desire for such medication.[27] However, this irrational prescribing behavior may encourage parents' false idea of antibiotics to treat URTIs and its side effects. Self-medication with antibiotics is more common in the developing countries due to factors such as ready availability of antibiotics without prescription, the unrestricted access to antibiotics, lack of regulation over drugs, and physicians and pharmacists prescribing and dispensing antibiotics without regard to the cause of infection.[18,21,28]

CONCLUSION

The results obtained indicate good parents' knowledge and practice regarding proper management of URTIs for the majority of participants. However, interventions are still needed. We suggest health education campaigns, professional education, and the implementation of new policies that will ideally help in raising awareness of the public about the proper management of URTIs and limit unnecessary use of medications. Since this study is the first of its own in the region, further studies must be conducted on a larger sample of the population to confirm the results.

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LIMITATIONS

The cross-sectional design of the study is susceptible to recall bias, which might affect the accuracy of the result.

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