

Assessing the Awareness among Parents of Antibiotic Therapy Delivered to their Children in Al-Ahsa

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Abstract: ***Objectives:** This study aims to estimate the awareness among parents about antibiotic therapy given to their children in Al-Ahsa community. **Methods:** Self-administrated questionnaire was distributed among parents of 800 students in a cross-sectional study. The target population of this study was parents' of children between the ages from 5-12 years. Simple random sampling was done among all Al-Ahsa primary schools and kindergartens (8 primary schools and 2 kindergartens were chosen) and the children were selected by systematic sampling. **Results:** Out of total responses, data for 525 (65.6%) parents were considered valid for analysis. Only 81 (15.4%) of the parents knew that the aim of using antibiotics is to treat bacterial infections. Majority of them (300; 57%) believed that antibiotics can treat all sources of infections (bacterial, viral, & fungal). However, majority of parents prefer to visit a doctor when their children get ill. Moreover, 271 (51.5%) of the sample heard about bacterial resistance. **Conclusion:** Majority of parents were not aware of the aim of using antibiotics and bacterial resistance. However, we expected that the risk of developing antibiotic resistance in the children of Al-Ahsa community should be low because majority of parents are avoiding giving antibiotics and they prefer to visit a doctor when their child is sick. However, further studies needs to be carried out to confirm this finding.*

Keywords: Antibiotic resistance, Al-Ahsa, Misuse, Parents awareness, Bacterial infection

1. Introduction

Antimicrobial resistance phenomenon is becoming a worldwide public health issue due to the inappropriate use of antibiotics, which have played a crucial role in the treatment of bacterial infections.^[1]

The development of antimicrobial resistance is fostered by inappropriate use of antibiotics for usually self-limited conditions.^[2] Treatment of viral infections by antibiotics is considered a misuse, which is common in children and currently considered to be a worldwide public health problem.^[3,6]

Because the risk of the spread of antimicrobial resistance is increased by using incorrect or unnecessary drugs or insufficient dosage, rising the costs of health services and increasing the burden of chronic diseases & side effects (e.g. adverse gastrointestinal effects).^[3] According to Simasek, these adverse effects have more significant impact in children health.^[3,7]

The behaviours that contribute to the overuse of antibiotics may include self-medication of antibiotics and over-the-counter use. In many middle-east countries that are similar to Saudi Arabia, these behaviours are considered a public health issue geographically and culturally.^[3]

However, a high rate of antibiotic sales without prescription for presumed urinary tract infection is demonstrated in a previous study from the Eastern Province of Saudi Arabia.^[8]

Because parental knowledge and attitude are two major factors contributing in antibiotic misuse toward

children,^[8] this study aims to estimate their awareness and attitudes of antibiotic therapy delivered to their children in Al-Ahsa community.

2. Methods

Study Site

The study site was in the eastern region of Saudi Arabia, Al-Ahsa (population is >1 million).

Study Design and Sampling

A community-based cross-sectional study was conducted in Al-Ahsa from November 2013 till December 2013. Two-stage cluster sampling was used to select 800 respondent parents to obtain a representative sample. In the first stage, 10 out of 446 primary schools and kindergartens were selected by simple random sampling (8 primary schools and 2 kindergartens). In the second stage, 80 students were selected from each sampled school or kindergarten by systemic random sampling, using lists of students names. The questionnaire was delivered to the parents through their student children.

Study Tool

A structured questionnaire was created, and it was involving three sections: (1) the demographic and socioeconomic characteristics of the parent ;(2) the general knowledge about antibiotics and bacterial diseases; (3) the response of parents when their children get ill.

The questionnaire was self-administrated and contained 23 multiple-choices and essay questions, including questions about the awareness toward antibiotics, causes of use,

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knowledge of risks, knowledge about bacterial resistance, and attitude of parents when their child gets sick.

Data Analysis

Data analysis: Microsoft Excel program was used to enter the data into a database, and the Statistical Package for the Social Sciences (SPSS) version 18 was used to analyze the data. The socio-demographic characteristics of the respondents, the awareness about the aim of using antibiotics and bacterial resistance and the action toward sickness of the child were described using descriptive statistics. Linear regression was applied to find if there was significance different in the demographic characteristics in relation to the knowledge of antibiotics use and resistance.

Ethical Consideration

The purpose of the study was clarified to the parents and asked if they were willing to participate. Written consent and signature was then obtained from study participants. The connection with female schools was only by phone calls and study forms were given to the guard. The questionnaire was completed anonymously, and by using code numbers assigned to each questionnaire. Ethical clearance was obtained from the King Faisal University, college of medicine, department of family and community medicine. First, the permission and approval to conduct the study was taken from the dean of scientific research in the college, and the permission to conduct the study and questionnaires in the selected schools was taken from the school managers in charge.

3. Results

The questionnaires were completed by 525 parents (65.6% response rate). There was no obvious difference in responsiveness between male and female respondents (53.3% and 40.8% respectively). Parents' personal characteristics and demographic information are summarised in Table 1. With regard to age, the average age category in the study appears to be 30-40 years old (43.4%). Moreover, the majority of male and female had a school education (51.4%), while (42.3%) had diploma or bachelor degree. However, only 2.9 percent of parents were uneducated and 1.9 percent had master or higher degree. Most parents – mainly male parents - were employed as civil servants (42.1%). The predominant category of number of children in the sample was 3-4 children with 41.1 percent.

Parents were asked about their knowledge regarding the aim of using antibiotics and the knowledge of bacterial resistance (see Table 2). According to the parents, only 81 (15.4%) knew that antibiotics could cure only bacterial infections, whereas majority of them 300 (57%) thought that antibiotics will treat all kind of infections include bacterial, viral, and fungal infections. A small portion (n=9; 1.8%) selected a combination of either bacterial and viral or bacterial and fungal infections. To examine the relationship between the knowledge of the aim of using antibiotics and various potential predictors, correlation and linear regression analysis were conducted. Table 3 summarizes the descriptive statistics and analysis results. As can be seen, these variables statistically no significance difference predicted regarding aim of using antibiotics, $F= 2.219$, $p<0.05$, $R^2 = 0.030$

except for educational level (See Graph 1) and the model used was Enter. Regarding bacterial resistance, there are approximate percentages between parents who have heard about bacterial resistance and parents who never have heard about it 51.6% and 48.4% respectively. Parents who mentioned right causes which lead to bacterial resistance (15.4%) are slightly less than those who mentioned wrong causes (22.7%). However, 325 (61.9%) of them did not know or mention any cause. Linear regression was run to predict the knowledge of bacterial resistance from different variables, there was a significant association between the knowledge of bacterial resistance and educational level ($p<0.001$ Graph 1).

Practices and behaviors of the parents related to 9 different symptoms of diseases were recorded. These diseases included sore throat, vomiting/emeting, diarrhea, influenza, fever, ear pain, abdominal discomfort, and cough. Though only 10.9% of parents used to give antibiotic when there was sore throat in their child, but it was recorded as the most prevalent symptom in which parents chose to give antibiotic. Considerable the majority of parents however visit a doctor in such a condition with the percent of 74.4. In general, visiting a doctor registered the highest frequency among all choices in all symptoms with 76.5% in case of vomiting, 64% in diarrhea, 67% in influenza, 70.7% in ear pain, 67.8% in abdominal discomfort, 60.2% in cough, and the least one with fever with 54.5% while 38% used paracetamol (See Graph2).

Also, sources of information were obtained. Most parents 236 (45.4%) had their information from previous experience. However, 125 (24%) got their knowledge from doctors while 111 (21.3%) had it from multiple sources.

4. Discussion

The current study aimed to analyze knowledge and attitudes concerning antibiotic use and practices in the management of childhood infections in a large sample of parents in Al-Ahsa. Majority of the parents included in our study are not aware of the exact aim of using antibiotics and also not aware of bacterial resistance or its causes. These findings are opposite with the findings of a study carried out in Palestine were most of the parents knew that antibiotics misuse is responsible for bacterial resistance.^[10]

A major problem with lack of knowledge about antibiotics and its implications is the emergence of drug resistance. Antimicrobial resistance is a current problem world-wide; particularly in developing countries. It is widely believed that human malpractices such as inadequate dosing, incomplete courses and indiscriminate drug use have contributed to the emergence and spread of antimicrobial resistance. The consequence of this is the loss of relatively cheap drugs that will require new drugs development, which will be more expensive and will further disadvantage patients in developing countries such as Saudi Arabia. The rational use of antibiotics is thus of utmost importance to limit the increase in bacterial resistance.^[11] In Saudi Arabia, antibiotics can be purchased from the pharmacy without a prescription, however, antibiotic use without visiting a doctor was only 10.9% of the study participants when their

child had URTI (being the most symptom parents used to give antibiotics). This rate is slightly lower than reported from a similar study done in Riyadh (11.6%) UAE (36%), Syria (57%), Jordan (39.5%), and Greece (22.7%), but much closer to the studies from USA (12% in suburban areas), Hong Kong (9%), and UK (5%).^[12]

The total response rate of the study was 65.62%. However, the schools and kindergarten located in the village have higher response rate (83.75%) in compare with only 55% in the town, and this might be due to social contact issues. The respondents were mostly in the age group 20-40 years (66.4%) possibly this is due to that their age group was better informed about the use of antibiotics.

The study also identified parents' gender, educational level, residency, and certain occupational types as socio-demographic predictors of parents evaluation of the awareness of antibiotic usage. Surprisingly, differences in perception regarding antibiotic resistance were noted when responses were stratified by occupation. Those parents who are civil servant have more knowledge comparing with private sector workers and self employed. Parents' education level had a trend effect on their perceptions of the right cause of antibiotic resistance. Specifically, 9.6% of parents who are school educated knew the right cause in compare with 22.5% of parents who have diploma or bachelor degree. Surprisingly, 55.4% of parents with diploma or bachelor degree believe that antibiotic treat all types of infections(bacterial, viral, and fungal).

5. Limitations

Though most of respondent 74.4% choose to visit a doctor in such conditions mentioned in the questionnaire, they choose the ideal option and what they should do rather than what they actually did. The questionnaires were distributed within primary schools in order to gain more generalized percentages of the community. However unless there is more than one child in the household, parents of children under the age of six will not be represented in such a sample. Consequently, this could be considered a source of bias. Furthermore, another limitation is the low sample size (525) because of low budget. Also, the questionnaire is Self-administered and the respondent may search about the questions related to antibiotic resistance before answering the question, even though only small portion (15.4%) mentioned the right cause of antibiotic resistance. Finally, the private schools weren't included in our study which may consider as a source of bias.

6. Strengths

Usually, when a filled questionnaire asked to be returned from potential responders, they neglect to meet the requirements of the study because they do not undergo pressure i.e. by an interviewer. As mentioned in the methods of this research, as soon as the parents filled the questionnaires, the students gave them to the teachers who afterwards submitted them to the researchers. This shows that the school-based sampling was very helpful in achieving a high response rate compared to sending questionnaires directly to parents, without their being convinced by school

authorities. Moreover taking into account main drawbacks, this kind of data collection was preferred over the pattern of interviewing the parents. First, the interviewer might guide the parents' response during their interviewing, and secondly interviews may respond in accordance with what they believe to be the "correct" replies. Additionally, the quality of the respondents' answers could be affected due to the probability of the responders' embarrassment towards the interviewer. Finally, the variability among the interviewers should be considered.^[9]

7. Conclusion

This study indicates that self-medication with antibiotics is uncommon in Al-Ahsa community. Also, it is just a few percentage of parents know that antibiotics can cure only bacterial infections, whereas majority of them think that antibiotic will treat all kinds of infections. Roughly, half of the respondents have heard about bacterial resistance, and only small portion of them knew the right causes of it.

Amongst symptoms, the study indicates that sore throat has been recorded as the most prevalent symptom in which parents select to give antibiotic to their children. In general, visiting a doctor registered the highest frequency among all choices in all symptoms.

Therefore, it is concluded that there is a need for well structured interventions based on creating more awareness simultaneously towards parents about antibiotics given to their children, bacterial resistance and its causes, the indications for using antibiotics, and how to deal with them.

8. Conflict of Interests

None to declare

9. Funding Disclosure

None to declare

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Table 1: Demographic characteristics of the study participants

Variable	Frequency	Percent
Age		
20-30	106	20.20%
31-40	228	43.40%
41-50	119	22.70%
> 50	50	9.50%

Missing	22	4.20%
Gender		
Male	281	53.50%
Female	214	40.80%
Missing	30	5.70%
Educational level		
Uneducated	15	2.90%
School education	270	51.40%
Bachelor	222	42.30%
Master or higher	10	1.90%
Missing	8	1.50%
Occupation		
Unemployed	185	35.20%
Civil servant	221	42.10%
Private sector	75	14.30%
Self employed	33	6.30%
Missing	11	2.10%
Residency		
Town	251	47.80%
Village	238	45.30%
Missing	36	6.90%
Number of children*		
2-Jan	93	17.70%
4-Mar	216	41.10%
6-May	110	21.00%
> 6	94	17.90%
Missing	12	2.30%
*Children less than 12 years old.		

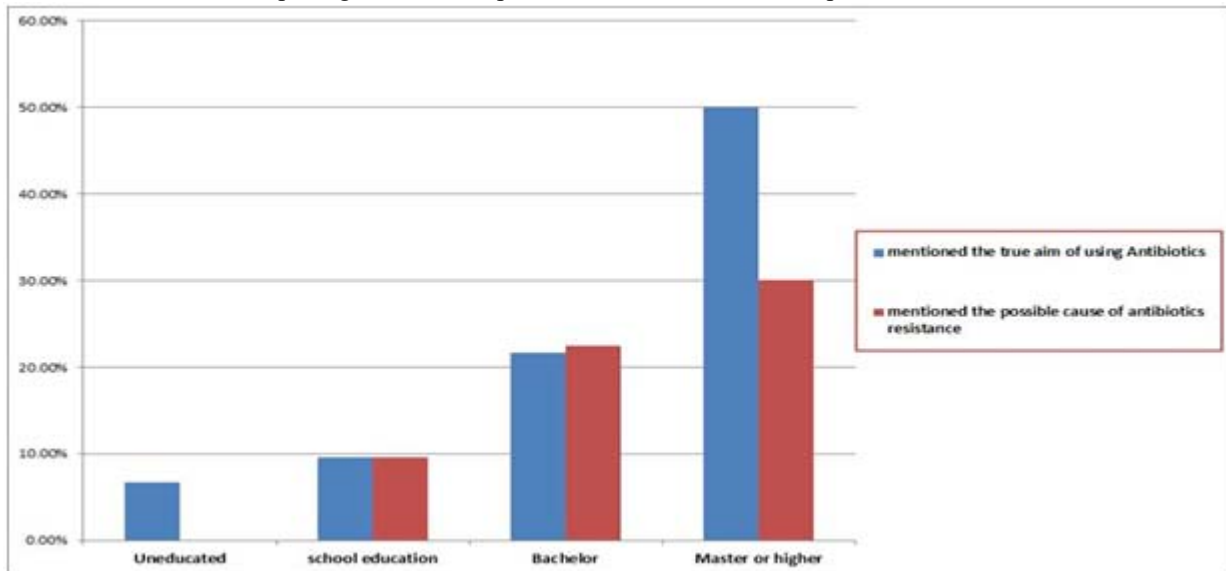
Table 2: Assessment of parents awareness regarding antibiotics

What is the aim of using antibiotics?	Frequency	Percent
Treatment of bacterial infections	81	15.40%
Treatment of viral infections	84	16.00%
Treatment of fungal infections	3	0.60%
All of the them	300	57.10%
I don't know	47	9.00%
Treatment of bacterial & viral infections	4	0.80%
Treatment of bacterial & fungal infections	5	1.00%
Treatment of viral & fungal infections	1	0.20%
Have you ever heard about bacterial resistance to drugs?		
Yes	271	51.60%
No	254	48.40%
what is the cause according to your knowledge ?		
TRUE	81	15.40%
FALSE	119	22.70%
I don't know	325	61.90%

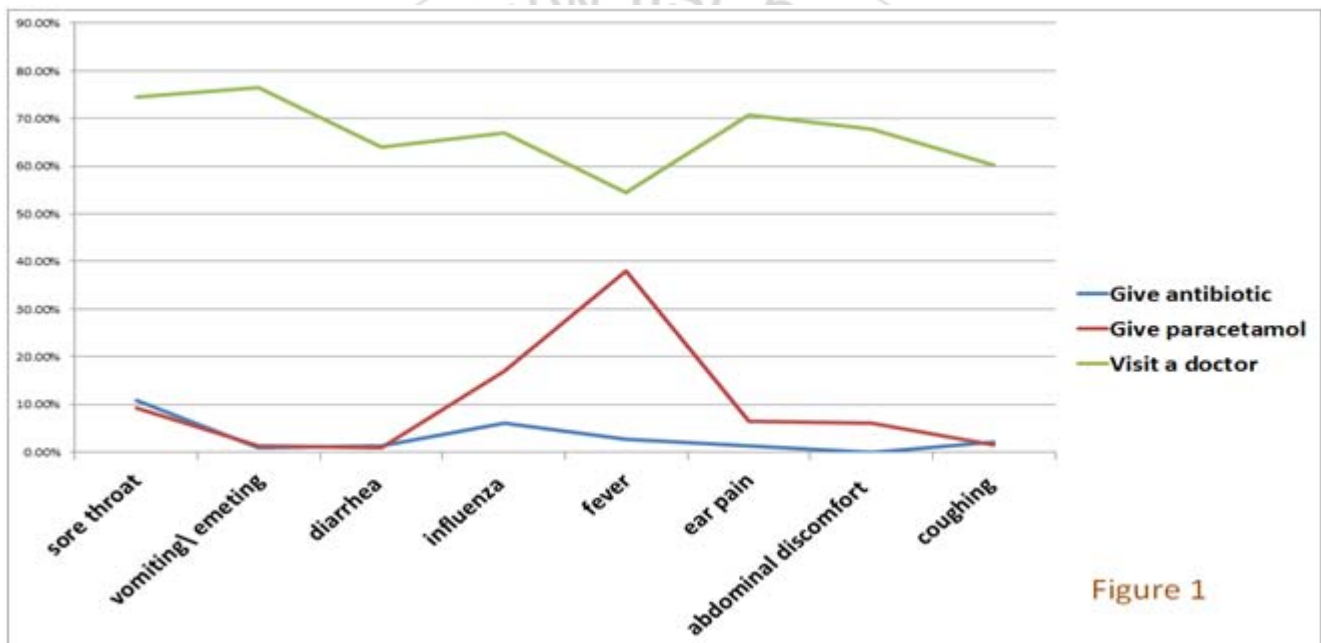
Table 3: Dependent Variable: aim of using antibiotics

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	3.606	0.47		7.678	0	2.683	4.528
Age	-0.044	0.079	-0.029	-0.549	0.583	-0.199	0.112
Gender	0.257	0.14	0.093	1.834	0.067	-0.018	0.532
Education	-0.297	0.11	-0.126	-2.699	0.007	-0.513	-0.081
source of information	0.046	0.048	0.045	0.969	0.333	-0.048	0.14

Multiple regression for dependent variable based on independent variables



Graph 1: Relationship between educational level and the knowledge about antibiotics



Graph 2:

Parents' attitude on usage of antibiotics

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