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Study of Maternal knowledge, Attitude and Practice on Antibiotic Use for Acute Upper respiratory Tract Infection in Children

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Abstract:
Background: *Upper respiratory tract infections (URTIs) are common in children. The cause of URTIs is usually viral, but mothers' knowledge, attitude and practice (KAP) often contribute to inappropriate use of antibiotics, and thus promoting antibiotic resistance.*
Objective: *To investigate maternal knowledge, attitude and practice of antibiotics use in children with acute upper respiratory infections and to determine the relation between mother's socioeconomic factors and their KAP toward the use of antibiotics.*
Methodology: *A cross-sectional study was carried out in two public health centers (PHC) at Zagazig city and Sheba village, in the period from December 2014 to January 2015. Sixty mothers of children (aged from 1 to 7 years) presenting with URTI symptoms were included.*
Results: *positive correlation between mother's knowledge and their attitude towards the use of antibiotics in their children with URTI (Pearson correlation = 0.22*), and correlation between mother's knowledge and their practices was negatively correlated (Pearson correlation = 0.35). No significant correlation between knowledge, practice and attitude and mother's age, and family monthly income was significantly correlated with moderate knowledge, poor practice and the neutral attitude towards antibiotic use.*
Conclusion: *mothers' level of knowledge was moderate and that level affect attitude but not affect the practice toward use of antibiotics, also knowledge level is affected by mother's socioeconomic characteristics.*
Key words*: Antibiotics, upper respiratory tract infection, mothers KAP.*

I. Introduction

Children are particularly challenging group of patients when trying to ensure the safe use of medication [(1)]. Upper respiratory tract infections are generally mild in nature and most often caused by viruses, sometimes with a bacterial component as in some cases of sinusitis and otitis media [(2)]. Thus, the benefit from antimicrobial drugs is minimal. However, there is strong evidence that antibiotics are frequently administered to children suffering from URTIs [(3)]. Upper respiratory tract infection in children is a common cause of health care visits and antibiotic prescription that increases the likelihood for emergence of antibiotics-resistant microorganisms leading to increased illness, deaths, and substantial economic loss [(4)].

Worldwide antibiotic over prescribing is a major health problem, which contributes to antibiotic resistant bacteria. Antibiotics are frequently prescribed for the management of upper respiratory tract infections, in spite of the fact that the majority of these infections are viral in origin [(5)]. A recent report has documented that even if common RTIs are caused by bacteria, the probability of their resolution without the administration of antibiotics is high.

It has estimated that 20-50% of all antimicrobial use is inappropriate. Factors leading to inappropriate use of antibiotics in children are complex, involving parental knowledge, practice and attitude, physician believes as well as constraints of daily practice [(3)]. Unnecessary prescription of antibiotics is the main driver for the development of antibiotic resistance and both pediatricians and parents contribute to this problem [(6)].

According to the European Surveillance of Antimicrobial Consumption Network (ESAC-Net) in 2010, antibiotic consumption is on the rise (from 2005-2010) worldwide. Although carbapenems are expensive, sales in Egypt, India, and Pakistan have increased with over the counter availability. Non-prescription of antibiotic use is common in many countries, while discouraging unnecessary use is a challenge. Non-prescription use accounts for 19–100% of antibiotic use outside Northern Europe and North America. Even when prescriptions are needed to obtain antibiotics, physicians might not adequately screen for appropriate use [(7)].

In Egypt acute respiratory infections represent less than half of the deaths in under-five children and are responsible for 39% of outpatient consultations at primary health care (PHC) facilities; they are also a common reason for hospital admissions [(8)]. The proportion of children ill with acute respiratory infection (ARI) for whom medical advice was sought ranged from less than 60 percent in rural Upper Egypt to more than 80 percent in urban Lower Egypt. Urban children are most likely to receive proper management and antibiotics prescription [(9)].

Few papers have examined maternal knowledge, practice and attitude towards antibiotic use in their children with upper respiratory tract infections in Egypt; although several reports have studied the resistance patterns of respiratory pathogens and a few small studies from individual institutions have been reported in Egyptian medical journals. This study was therefore undertaken to investigate maternal knowledge, attitude and practice of antibiotic use in children with acute upper respiratory infections, and determine the relation between mother's socioeconomic factors and their KAP toward the use of antibiotics in their children.

Research Questions:

1. What are the mother's knowledge, attitude and practice (KAP) towards antibiotic use in their children with acute upper respiratory tract infections?
2. What is the relation between mother's socioeconomic factors and their KAP?

Objective:

1. To investigate maternal knowledge, attitude and practice of antibiotics use in children with acute upper respiratory infections.
2. To determine the relation between mother's socioeconomic factors and their KAP toward the use of antibiotics.

II. Subjects and methods:

A cross-sectional study was carried out in two public health centers (PHC) at Zagazig City and Sheba Village, in the period from December 2014 to January 2015. The inclusion criteria were mothers of children (aged from 1 to 7 years) presenting with URTI symptoms, who were available in the time of study and accepted to participate in the study, informed consent was obtained from all mothers, and made them be aware that information used only for research purpose. The study was approved by the Directorate of Health Affairs in Zagazig City. A pilot study of 10 children was conducted to test validity and reliability of data collection tool and excluded from total sample. Total sample size was sixty mothers. A pre-tested questionnaire was used in this survey adopted from a similar Greek Parental KAP towards Antibiotics use in URT infection in children. Permission was taken by email from the researchers, who used this questionnaire in Greece, to translate it in Arabic language and use for local study. The questionnaire contains demographic characteristics, and KAP-questionnaire, structured in three main sections which displayed the Knowledge (Section A), Attitudes (Section B) and Practices (Section C) of mothers regarding antibiotics use in URTI of their children.

Section (A) included questions regarding maternal knowledge concerning antibiotics. They were asked to mark antibiotic names out of seven commonly used medications and to answer questions relevant to antibiotics indications, side effects and their use in viral infections. Section (B) studied the maternal attitudes regarding URTIs, mothers were asked which symptoms and what duration would lead them to seek medical care for their children, as well as their expectations regarding antibiotics prescription. Other questions included reasons for antibiotic use without medical advice (over the counter acquisition of antibiotic, use of leftover antibiotic from previous illness, etc.) or whether they would seek for a doctor who is more lenient with antibiotic administration. Finally, (Section C) looked into maternal practices and whether the mother-doctor relation is influenced by the latter's attitude on antibiotic prescription. mothers were asked whether their doctor spends enough time explaining the illness and suggested antibiotic treatment for their child, whether he is influenced by their demand to prescribe antibiotics, as well as whether their doctors gives them instructions over the phone (without previous examination) for antibiotic administration to their sick child. Participants were interviewed individually by researcher to complete the questionnaire within 20–30 min.

Each question (apart from those included in the demographic data section) was in a format of five possible answers (accepting only one right answer), according to the 5-point Likert scale: 1 = strongly agree, 2 = agree, 3 = uncertain, 4 = disagree and 5 = strongly disagree or 1 = always, 2 = most of the times, 3 = often, 4 = sometimes and 5 = never.

The scoring system was (knowledge score=low < 33.3%, moderate 33.3 – 66.6%, and high > 66.6%, practice score= poor < 33.3%, fair 33.3 – 66.6%, and good > 66.6% and attitude score= negative < 23, neutral 23-31 and positive 32-45).

Data were entered and analyzed using SPSS version 16.0 (SPSS, Inc., Chicago, IL). The most appropriate tool to analyze data is the α-Cronbach's. To assess the mothers KAP toward the use of antibiotics, we calculated Pearson correlation coefficient. To account for the relation between sociodemographic factors and mothers KAP, statistical significance was set at $P<0.05$.

Table (1): Mothers Demographic Characteristics.

Mother data	No	%
Mother age (years)		
20-29	32	53.3
30-40	28	46.7
Mean SD	29.1 ± 5.0	
Education level		
Primary	6	10.0
Preparatory	18	30.0
Secondary	10	16.7
University	26	43.3
Monthly income		
High	7	11.7
Intermediate	49	81.7
Low	2	3.3
Very low	2	3.3
Residence		
Urban	7	11.7
Rural	53	88.3
Children number		
One	14	23.3
Two	27	45.0
Three	15	25.0
Four	4	6.7

Table (2): Child Characteristics and their Family Medical Data.

Child &Medical data	No	%
Child age (years)		
1-4	35	58.3
5-7	25	41.7
Child sex		
Male	34	56.7
Female	26	43.3
Go to nursery		
Yes	27	45.0
No	33	55.0
Recurrent URT infections		
Yes	47	78.3
No	13	21.7
Relation with physician		
Relative	10	16.7
Professional Relation	47	78.3
Friend	3	5.0
Accessibility to health services		
Very good	12	20.0
Good	24	40.0
Intermediate	18	30.0
Bad	6	10.0

Table (3): Mother's Knowledge, Practices and Attitude Regarding Antibiotic use

Item	No	%	X ± SD	A-Cronbach's
Knowledge (0-36)				
Moderate	46	76.7	21.9 ± 3.2	0.806
High	14	23.3		
Practice (0-92)				
Poor	32	53.3	32.0 ± 12.1	0.864
Fair	28	46.7		
Attitude (0-45)				
Neutral	36	60.0	27.4 ± 2.6	0.772
Positive	24	40.0		

Knowledge score=low < 33.3%, moderate 33.3 – 66.6%, and high > 66.6%.
Practice score= poor < 33.3%, fair 33.3 – 66.6%, and good > 66.6%.
Attitude score= negative < 23, neutral 23-31 and positive 32-45.

Fig. (1): Mother's knowledge, Practice and Attitude towards Antibiotic Use with their Children:

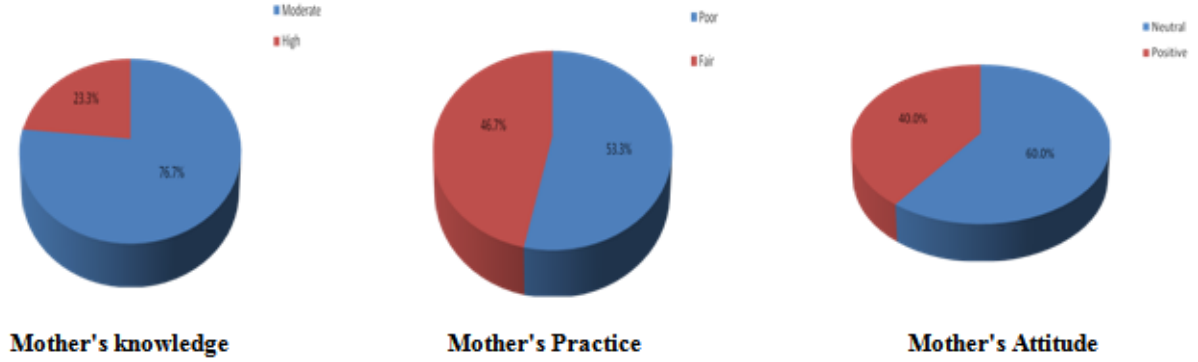

Fig. (2):Mother's Sources of Information Regarding Antibiotic Use with their Children:

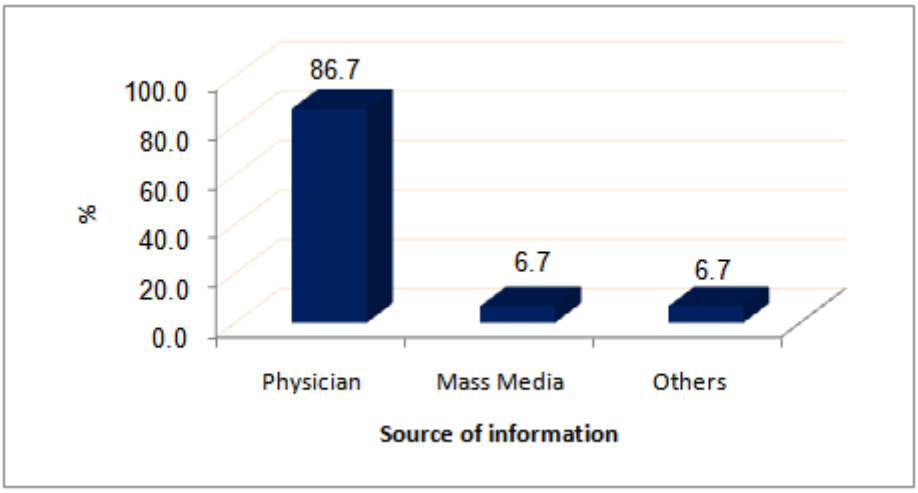

Table (4): Correlation Matrix for Relation between Mothers Knowledge, Attitude and Practice regarding Antibiotics Use with their Children with URTI.

Item	Knowledge	Practice	Attitude
Knowledge	1		
Practice	0.35	1	
Attitude	0.22*	0.29*	1

* Significant Pearson correlation coefficient

Interpretation of correlation coefficient

Weak (0.1-0.24) Intermediate (0.25-0.74) Strong (0.75-0.99)

Table (5): Relation between Mother's Knowledge, Practice, and attitude and their Sociodemographic Characteristics.

Mother data	Knowledge		Practice		Attitude	
	Moderate	High	Poor	Fair	Neutral	Positive
	%	%	%	%	%	%
Mother age (years)						
20-<30	75.0	25.0	53.1	46.9	53.1	46.9
30-40	78.6	21.4	53.6	46.4	67.9	32.1
FEP	0.744		0.972		0.245	
Education level						
Primary	83.3	16.7	66.7	33.3	50.0	50.0
Preparatory	83.3	16.7	55.6	44.4	72.2	27.8
Secondary	90.0	10.0	80.0	20.0	70.0	30.0
University	65.4	34.6	38.5	61.5	50.0	50.0
MCP	0.048*		0.131		0.412	
Monthly income						
High	71.4	28.6	85.7	14.3	57.1	42.9
Intermediate	75.5	24.5	46.9	53.1	61.2	38.8
Low	100.0	0.0	100.0	0.0	100.0	0.0
Very low	100.0	0.0	50.0	50.0	0.0	100.0
MCP	0.044*		0.039*		0.047*	

Residence						
Urban	57.1	42.9	71.4	28.6	71.4	28.6
Rural	79.2	20.8	50.9	49.1	58.5	41.5
FEP	0.038*		0.041*		0.043*	
Children number						
One	71.4	28.6	64.3	35.7	35.7	64.3
Two	74.1	25.9	55.6	44.4	66.7	33.3
Three	80.0	20.0	46.7	53.3	66.7	33.3
Four	100.0	0.0	25.0	75.0	75.0	25.0
MCP	0.049*		0.515		0.204	

FEP: Fisher exact probability MCP: Mont Carlo exact probability * P < 0.05 (significant)

III. Results:

Regarding the mother's sociodemographic characteristics, more than half of mothers (53.3%) aged 20-29 years, (mean ± SD = 29.1±5.0). Concerning mother's education (43.3%) of them were university educated and 30.0% were preparatory, while only 10.0% were primary education. Majority of mothers (81.7%) had intermediate monthly income and only 3.3% of them had very low income based on the self-report of mothers (table 1).

As regard child demographic characteristics, more than half (58.3%) of them aged 1-4 years (table 2). Regarding the recurrence of upper respiratory infections, the majority of children (78.3%) had recurrent infections and (40.0%) of their mothers considered the accessibility to health services as good and (30.0%) described it as very good and only 10.0% tolled that it is bad.

Fig (1) showed the mother's sources of information regarding the use of antibiotics with their children suffering from URTI, it revealed that physician was the major source of information (86.7%), while mass media represented 6.7% of mothers sources of information.

According to the mothers knowledge regarding the antibiotic use, the majority (76.7%) of them had moderate knowledge, and more than half (53.3%) had poor practice regarding the use of antibiotic of their children with URTI, while none of them had a good practices, and more than half of the mother's attitude (60.0%) was neutral while non of the mothers had negative attitude (table 3).

Table (4) showed the positive correlation between mother's knowledge and their attitude towards the use of antibiotics with their children with URTI (Pearson correlation = 0.22*). As regard the correlation between mother's practices and their attitudes, it was positively correlated (Pearson correlation = 0.29*). On the other hand, correlation between mother's knowledge and their practices was negatively correlated (Pearson correlation = 0.35)

Concerning the relation between mothers' knowledge, attitude and practice with their sociodemographic characteristics, (table 5) showed that, there is no significant correlation between knowledge, practice and attitude and mother's age. There was a significant correlation between mother's educational level and their knowledge (P= 0.048*). Concerning the family monthly income it was clearly significantly correlated with moderate knowledge, poor practice and the neutral attitude towards antibiotic use, the significant correlations were (P= 0.044*), (P= 0.039*) and (P= 0.047*) respectively.

Concerning the number of children in the family, it was significantly correlated with mother's knowledge regarding antibiotic use (P= 0.049*).

IV. Discussion:

Globally, young children consume considerable amounts of antibiotics. This is likely caused by their susceptibility to infections, particularly upper respiratory tract infections (URTI). Control of acute upper respiratory infections is a major problem of public health in developing countries, because of the higher prevalence of infectious diseases. One of the main causes of morbidity and mortality of children is the lack of mother's knowledge regarding care of their children Kardas et al [(10)]. Attitude and practice are the consequences of knowledge. Moreover, prevention and treatment of AURTI in children require accurate information about knowledge, attitude and practice of family especially mothers as they are the main care givers in families**.**

The present study found that (40.0%) of the mothers consider the accessibility to health services as good and (30.0%) describe it as very good and only 10.0% tolled that it is bad, this in line with Al-Dossari [(11)] ,where 61.4% of the parents in his study described access to health care system as good, while 3.4% of them described it as bad. Andreas et al., [(12)] mentioned that two thirds of parents were happy with their access to the healthcare system.

The study results showed that majority of mother's sources of information regarding the use of antibiotics with their children suffering from URTI, was by physician (86.7%), while mass media represented by 6.7% of mothers, this in line with Andreas et al., [(12)] in his study most parents identified their pediatrician as a major sources of information regarding use of antibiotics , also Al-Dossari [(11)] stated that most of parents (71%) reported doctors as their sources of antibiotic information, while media reported by 17.9% of them, Andreas et

al., [12] revealed in his study that doctors were major source of information as more than one third of them declared that they had an intimate relationship with their child's pediatrician. In contrast Xiang et al., [13] found that television has been identified as the preferred source of information.

Our study findings revealed that the majority (76.7%) of mothers had moderate knowledge; this may be explained as, many of mothers' responses indicate misunderstanding about antibiotic use and its benefits in infection treatment. More than half (53.3%) of them had poor practice regarding the use of antibiotic of their children with URTI, on the other hand none of them had a good practices, this may be as a result of bad communication between mothers and physicians about sharing experience of antibiotic administration and so mothers may reuse the left over from previous prescribed antibiotic. Regarding the attitude, more than half of the mother's attitude (60.0%) was neutral as the mothers believed that taking antibiotics in advance could protect children and shorten the duration of URTI symptoms, other previous studies conducted by different groups, Chan et al., [14], Hadi [15] and Hong et al., [16], showed that mothers who had low level of knowledge and attitude demonstrated low practice level in antibiotic use. In contrast, Jafari et al., [17] and Athumani [18] indicated that the level of mothers' knowledge was relatively high and the level of their attitude and practice was reasonable because of training programs. On another study carried by Andreas et al., [12], found that parents were knowledgeable in regard to antibiotic use, it is worth noticed that most of them believe that antibiotic use decrease duration or disease complications.

Our findings demonstrated that there is no significant correlation between knowledge, practice and attitude and mother's age, this in line with Jafari et al., [17] who found in his study, that there was no significant correlation between practice score and mother's age. This is because most of mothers believed that antibiotics use will faster the cure from infection and this will affect mother's practice and attitude. In contrast, Andreas et al., [12] found that parental age was correlated with knowledge, attitudes and practices, older parental age associated with better knowledge and judicious use of antibiotics.

Simiyu et al., [19] found that educational level influences the mothers' attitude and knowledge but not affect practice, this is in harmony with our finding that revealed a significant correlation between mother's educational level and their knowledge (P= 0.048*). In contrast Jafari et al., [17] stated that there was not significant correlation between educational level of the mothers and their knowledge, attitude and practice levels, and explained it as a result of high level of general knowledge of the society and abundance of health education programs, so that mothers with low educational level increase their KAP score and reach to the KAP score of educated mothers.

Our study findings revealed that moderate knowledge was significantly correlated with rural mothers more than urban ones (P=0.038), this may be due to better knowledge of urban mothers than those lived in villages about antibiotic use, this in line with Yu et al [20] who found that parents from central towns had a better knowledge of appropriate indications and of side effects of antibiotic use, while incorrect perceptions about antibiotics are prevalent among parents in rural China.

Although the study results showed that moderate knowledge correlated with mothers from rural areas as mentioned before, the poor practice was significantly correlated with mothers from urban areas (p=0.041), the cause may be related to the easy access to antibiotic purchasing from retail pharmacies without a prescription which are mainly located in populous areas, so in practice it is easy in towns to obtain antibiotics compared with rural areas. This finding was in harmony with Yu et al [20].

V. Conclusion:

The present study revealed that mothers' level of knowledge was moderate and that level affect attitude but not affect the practice toward use of antibiotics, also knowledge level is affected by mother's educational level, monthly income and place of residence.

VI. Recommendations:

- Healthy communication with mothers through mass media will be useful in enhancing and promoting changes in mothers KAP towards use of antibiotics with their children.
- Implement practical educational programs on antibiotic use for mothers as they are the main care giver for children at the health centers to improve their KAP towards the safe use of antibiotics, especially in rural areas.
- Strict enforcement of over-the-counter sale of antibiotics.

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