

## Maternal Knowledge and Treatment Practices Regarding the Use of Antibiotics among their Children with Upper Respiratory Tract Infection

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### Abstract

**Background:** Misuse of antibiotics in the treatment of URTI among children is becoming a major contributor to the emergence of antibiotic resistance that is becoming a major public health problem worldwide. Mothers must be equipped with essential knowledge and skills about proper antibiotics use for their children with URTIS to avoid antibiotic resistance.

**Aim:** The aim of this study was to assess maternal knowledge and treatment practices regarding the use of antibiotics among their children with URTIS.

**Method:** A cross-sectional descriptive design was conducted on a convenience sample of 100 mothers throughout 3 months who attending the General Outpatient Clinics number 4 and 5 and inpatient Cardiology and Medical departments at Mansoura University Children Hospital (MUCH). Data was collected by using a structured interview questionnaire sheet that consisted of three parts; characteristics of the studied mothers and their children, mothers' knowledge about antibiotics and mothers' practices regarding the use of antibiotics for their children with URTI.

**Results:** More than half of the studied mothers (64.0%) had poor knowledge about antibiotics and the majority of them (84.0%) had satisfactory practices regarding use of antibiotics for their children with URTI. A relationship was founded between mothers' knowledge and their residence, educational level and occupation with statistical significance ( $p \leq 0.05$ ). Also; a relationship was founded between the studied mothers' practices regarding giving antibiotic suspension for their children with URTI and their educational level with statistical significance ( $p \leq 0.019$ ).

**Conclusion:** it is concluded that more than half of the studied mothers had poor knowledge about antibiotics and the majority of them had satisfactory practices. Also, the studied mothers' knowledge is affected by their residence, educational level and occupation. As well as, the studied mothers' practices are affected only by their educational level.

**Recommendation:** it is recommended to implement health educational program for mothers about antibiotic use to improve their knowledge and practices towards the safe use of antibiotics for their children with URTI.

**Keywords:** URTIS, children, mothers, knowledge, practices, antibiotics and bacterial resistance.

### I. Introduction

Acute respiratory tract infections (ARTIS) are categorized into upper and lower respiratory tract infections based on the anatomical site and the affected respiratory tract part (**Vardanyan, 2013**). The morbidity and financial consequences connected with respiratory disorders are considerable and worthy with resulting immediate and underhanded expenses to the economy. In addition, these diseases are frequently connected with concerning mortality thus, they symbolize the main source of death in children younger than five years old around the world; these cause nearly 4 million deaths every year. In addition it is also the main source of febrile episodes and hospitalization in infants and children younger than three months of age (**Rotzén, Eriksson, Tiveljung, Allander, Zwegyberg and Grillner, 2014**). In Egypt, ARTIS symbolize less than half of the deaths in under-five children and are in charge of 39 percent of consultations at primary health care facilities; in addition they are a frequent cause for hospital admissions. The ratio of children with ARTI extends to less than 60 % in rural Upper Egypt to more than 80 % in urban Lower Egypt (**Moustafa, 2015**).

Upper respiratory tract infection (URTI) is noncertain expression used to depict intense contagious diseases including the area from the nasal cavity to the larynx (**Hockenberry and Wilson, 2015**). URTIS happen frequently with mild course and few complications but lead to international outbreaks that in charge of infection spread. Bacterial organisms just act about 10 percent of all upper respiratory tract diseases with the consequent 90 percent of infections happened by respiratory viruses that include adenoviruses, parainfluenza

viruses, influenza viruses, enteroviruses, corona viruses, rhinoviruses and respiratory syncytial viruses (Esposito, Daleno, Prunotto, Scala, Tagliabue, Borzani et al., 2013). URTI is usually involves common cold, sinusitis, pharyngitis, tonsillitis, otitis media and laryngitis that extent from gentle, nonserious trouble to dangerous life threatening status, within every class of disease there is a scope of associated conditions that may have identical or interfering clinical manifestations (Brady, 2009). The upper respiratory tract illnesses load is common in children with persistent co morbidities or clinical hazard agents involving young and immunocompromised children, chronic obstructive pulmonary disease (COPD) and asthma (Gorse, O'Connor, Hall, Vitale and Nichol, 2009).

If URTIS are not managed early, they may cause certain complications such as rheumatic fever, glomerulonephritis, pneumothorax and pneumonia that raise the risk of child mortality. Mothers play an important role in the treatment of their children with URTIS by understanding that recognizing the mild, moderate and severe respiratory infections, appropriate decision making and initiating correct home care quickly to avoid infection progress as unawareness and insufficient knowledge are necessary reasons that affect children's health (Rajan, Mathew and Raj, 2016). The discovery of antibiotics has an obvious essential milestone in the medicine history. Their role in decreasing the mortality and morbidity of illnesses occurred by bacteria is beyond any suspicion. The utilization of antibiotics has become a usual habit for the management of pediatric diseases. In spite of the antibiotics viability in the curing of various bacterial infections, it is often utilized improperly. Antibiotics are the most repeatedly recommended and abused medications and this prompting the rise and expansion of antibiotic-resistant germs that is considered nowadays one of the significant public wellbeing matters around the world (Panagakou, Spyridis, Papaevangelou, Theodoridou, Goutziana, Theodoridou et al., 2011). In spite of the viral source of most upper respiratory disorders, antibiotics are frequently recommended in the management of these infections which trigger its abuse (Pavia, 2011). A significant part of recommended antibiotics is viewed as unimportant and such recommendations might be because of reasons concerning to guardians or the doctors. In addition, absence of rigid and strict application of regulations on over-the-counter antibiotics sales leads to easy access to antibiotics for self-medication as about 66.66 percent of most antibiotics are administered to children according to medical prescriptions; the remains of antibiotics are administered without prescriptions (Haung, Hsieh, Hung and Hsiao, 2012). Self-medication especially for common colds and upper respiratory tract manifestations which are self-restricting and mostly occurred by viruses is stand out amongst the most reasons lead to resistance of antibiotics (Sarahroodi, Arzi, Sawalha and Ashtarinezhad, 2010).

Mothers' knowledge and practices about the proper use of antibiotics have necessary impacts on the management of their children diseases (Togobaatar, Ikeda, Ali, Sonomjamts, Dashdemberel, Mori et al., 2010). Thus; concentration on the factors that impacting mothers' knowledge and practices about utilization of antibiotics lead to prompt lessening in the prevalence of antibiotic misuse. As well, teaching the parent about antibiotic management and attention to antibiotic resistance are notion to impact their interest for antibiotic order and expand their knowledge and skill for using antibiotics among their children (Bajeti and Jovanovi, 2012). Finally, the pediatric nurses play an important role that could lead to the reduction in antibiotics misuse among children with URTIS. Health education of mothers about the importance of proper use of antibiotics, nurses-mothers communication and interactions and involvement in the decision making process. Also, policy change, such as: delaying antibiotics prescription for 48 hours which will give the self-limiting conditions time to heal without the use of medications as well as choosing the best intervention protocol relays on discovering the most influencing factors associated with this overuse and trying to solve and control these factors. So, receiving feedback about mothers' knowledge and practices regarding use of antibiotic to facilitate their behavior change, provide a better care to their children with URTIS and enhance their quality of life (Vandana, Dipti and Rajakumari, 2013).

#### **Aim of the study:**

The aim of this study is: assessment of mother's knowledge and practices regarding the use of antibiotics among their children with upper respiratory tract infection.

#### **Research questions:**

- What is mothers' knowledge regarding the use of antibiotics for their children with upper respiratory tract infection?
- What are mothers' practices regarding the use of antibiotics for their children with upper respiratory tract infection?
- Is there is a relation between maternal knowledge and practices regarding the use of antibiotics for their children with upper respiratory tract infection and their socio-demographic data?

## II. Subjects and Method

### Research Design:

A cross sectional descriptive design was used to accomplish this study.

### Setting of the study:

The study was conducted at the General Outpatient Clinics number 4 and 5 and inpatient Cardiology and Medical departments at Mansoura University Children Hospital.

### Research Subjects:

A convenient sample of 100 mothers with their children who was attending the previously mentioned setting over a three month period having the following criteria:

- Both sexes regardless their age.
- Diagnosed with upper respiratory tract infection.
- Free from other chronic diseases.
- Managed by antibiotics.
- Willing to participate in the study.

### Tool of Data Collection: (Appendix 2)

Data was collected using a structured interview questionnaire sheet that developed by the researcher after reviewing of related literature into Arabic language. It included three parts:

#### Part I: Characteristics of the studied mothers and their children:

It includes data about mother's age, level of education, marital status, occupation, family income, residence, access to health services and number of siblings. Children age, sex, birth order and children clinical data (children medical history with URTI) that obtained either from child's file and/or his/her mother such as: type of URTI, frequency, hospital admission, complications, medications prescribed during URTI and the last time receiving antibiotic.

**Part II: Mothers' knowledge about antibiotics used for URTI among children; it consisted of 10 questions about:** definition of antibiotics, purposes, indications, type of infection that antibiotic should be used, antibiotics prevent complications from URTIS, side effects.....ect.

#### ❖ Scoring system for maternal knowledge regarding use of antibiotics among their children with URTI:

For each question; one was given for correct answer and zero for incorrect answer or didn't know. The total marks were 19.

#### Mothers' knowledge score was classified according to El-Wasefy 2015 into:

- Good knowledge for score : >75% ( 14.3- 19 degrees).
- Average knowledge for score: 50-75% (9.5 -14.25 degrees).
- Poor knowledge for score: < 50% (<9.5 degrees).

#### Part III: Mothers' practices regarding the use of antibiotics for their children with URTI that consisted of three parts:

##### Part A: Consisted of 16 questions pertaining to mothers' practical knowledge regarding use of antibiotics for their children with URTI such as:

Actions taken when the child suffer from URTI, symptoms that leading mothers to visit pediatrician, reasons for administering antibiotic without prescription, asking for the reason why antibiotic is prescribed, using the previous residual amount of antibiotic for the same symptoms, phone antibiotic prescription, read the expiration date of antibiotics before use.....ect.

#### ❖ Scoring system for mothers' practical knowledge regarding use of antibiotics for their children with URTI:

For each question; one was given for correct answer and zero for incorrect answer or don't know. The total marks were 14.

#### Mothers' practical knowledge regarding use of antibiotics for their children with URTI score was classified according to El-Wasefy 2015 into:

- Good practical knowledge for score : >75% (10.55 - 14 degrees).
- Average practical knowledge for score: 50-75% (7 –10.5 degrees).
- Poor practical knowledge for score: < 50% (<7 degrees).

##### Part B: Consisted of 12 questions pertaining to mothers' practical knowledge regarding preparation, using and storage of antibiotic suspension such as:

Reading label instructions before preparation, type of water used for suspension preparation, tool used for measuring the amount of water needed for preparation, the process of suspension preparation, tool used for measuring the suspension dose.....ect.

❖ **Scoring system for mothers' practical knowledge regarding preparation, using and storage of antibiotic suspension:**

For each question; one was given for correct answer and zero for incorrect answer or don't know. The total marks were 14.

**Mothers' practical knowledge regarding preparation, using and storage of antibiotic suspension score was classified according to El-Wasefy 2015 into:**

- Good practical knowledge for score : >75% (10.55 - 14 degrees).
- Average practical knowledge for score: 50-75% (7 –10.5 degrees).
- Poor practical knowledge for score: < 50% (<7 degrees).

**The total score for mothers' practical knowledge were (28 marks), classified according to El-Wasefy 2015 into:**

- Good practical knowledge for score : >75% (21.25 - 28 degrees).
- Average practical knowledge for score: 50-75% (14 –21 degrees).
- Poor practical knowledge for score: < 50% (< 14 degrees).

**Part C: Observational checklist:** that developed by the researcher after reviewing the related checklists. It includes ideal 10 steps regarding administering antibiotic suspension by mothers for their children with URTI.

❖ **Scoring system for observational checklist:**

A score of two was given to done completely, one was given to done incompletely and zero was given to not done. The total marks were 20.

**Mothers' practice regarding giving antibiotic suspension for their children with URTI score was classified according to El-Wasefy 2015 into:**

- Mothers' practices score more than 60%; they had satisfactory practices (12.5-20 degrees).
- Mothers' practices score less than 60%; they had unsatisfactory practices (< 12.5 degrees).

**Method:**

**1- Administrative considerations were followed through:**

1. An official permission was obtained by submission of an official letter issued from the Dean of Faculty of Nursing, Mansoura University, to the head of the outpatient clinic to conduct the study after explaining the aim of the study.
2. The developed tool was submitted to a jury of five experts in the nursing field including staff members from Mansoura Faculty of Nursing, Pediatric Department (3 members) and Community Department (2 members) for its content validity. Based on their comments; necessary modifications were done.
3. The developed tool was tested for its reliability using Cronbach's alpha coefficient test by a statistician by measuring the internal consistency of its items:
  - ❖ For the knowledge part (part II), the tool was reliable as  $r = 0.73$ .
  - ❖ For the practices part (part III), which is divided into:
    - ✚ Practical knowledge regarding use of antibiotics for their children with URTI, the tool was reliable as  $r = 0.77$ .
    - ✚ Practical knowledge regarding preparation, using and storing antibiotic suspension, the tool was reliable as  $r = 0.70$ .
    - ✚ Mothers' practice regarding giving antibiotic suspension for their children with URTI (observational checklist), the tool was reliable as  $r = 0.652$ .
4. A pilot study was carried out on 10 mothers (10% of sample), to ascertain the feasibility, applicability and clarity of the tool and some modifications were made consequently. These mothers were excluded from the final study sample.

**2- Ethical considerations were followed through:**

1. Ethical approval was obtained from Research Ethics Committee at the Faculty of Nursing - Mansoura University.
2. Informed oral consent was obtained from each mother after explaining the aim of the study.

**Statistical Analysis:**

The collected data were coded and entered in a data based file using the excel program for windows. Frequency analysis and manual revision were used to detect any error. After complete entry, data were transformed to the statistical package of social sciences (SPSS) version 17.0 by which the analysis was conducted applying frequency tables with percentages. Data were revised, coded and analyzed. Qualitative data was presented as number and percent. The Chi-Square test or fisher's exact test was used for comparison between groups as appropriate. All tests were performed at a level of significance (P-value) equal or less than 0.05 was considered to be statistically significant. Quantitative data were described as mean / SD or medians as appropriate. They were tested for normality by Kolmogorov-Smirnov test.

### III. Results

Sociodemographic characteristics of the studied children are illustrated in **table (1)**. It was found that, more than half of the studied mothers (61.0%) were in the age 20 to30 years with a mean age of  $28.73 \pm 4.55$  years. Three quarters of the studied mothers (75.0%) were living in rural area. More than two third of the studied mothers (69.0%) had either two to three child. Slightly less than half of the studied mothers (49.0%) had completed diplom education. Slightly more than two third of the studied mothers (67.0%) were housewives. Less than three quarters of the studied mothers (71.0%) stated that their income was enough. Regarding access to health services, more than half of the studied mothers (61.0%) stated that their access was good. The same table revealed that, the studied children mean age was  $3.76 \pm 2.41$ years. Slightly more than half of the studied children (51.0%) were girls. Regarding their birth order, less than half of the studied children (47.0%) were the first child.

**Figure (1):** clarified total mothers’ knowledge about antibiotics. More than half of the studied mothers (64.0%) had poor knowledge. While, less than one third of them (31.0%) had average knowledge and only 5.0% had good knowledge.

Regarding the studied mothers' total practical knowledge regarding use of antibiotics for their children with URTI, **figure (2)** illustrated that, slightly more than three quarters of the studied mothers (76.0%) had average total practical knowledge, while less than one quarter (18.0%) and only (6.0%) of them had good and poor total practical knowledge regarding use of antibiotics for their children with URTI respectively.

Concerning total mothers’ practices regarding giving antibiotic suspension for their children with URTI, **figure (3)** showed that, the majority of the studied mothers (84.0%) had satisfactory practice, while (16.0%) of them had unsatisfactory practice regarding giving antibiotic suspension for their children with URTI.

**Table (2):** presented the relationship between the total score of the studied mothers' knowledge about antibiotics and their socio-demographic characteristics. It was observed from the table that there was statistical significant difference between mothers’ knowledge about antibiotics and their residence, education and occupation ( $P \leq 0.05$ ).

**Table (3):** represented the relationship between total score of the studied mothers' practical knowledge regarding use of antibiotics for their children with URTI and their socio-demographic characteristics. It is clear from the table that, all of the married studied mothers had good total practical knowledge. There was statistical significant difference between the studied mothers’ total practical knowledge regarding use of antibiotics for their children with URTI and their marital status ( $p \leq 0.003$ ). All of the studied housewives mothers had “poor” total practical knowledge. All of the studied mothers who stated that their health services access was good had total “poor” practical knowledge regarding use of antibiotics for their children with URTI.

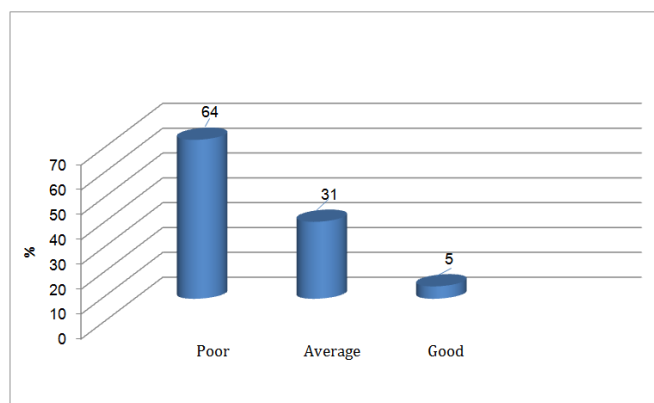
**Table (4):** showed the relationship between total score of the studied mothers' practices regarding giving antibiotic suspension for their children with URTI and their socio-demographic characteristics. Apparently, this table revealed that, There was statistical significant difference between the studied mothers’ practices regarding giving antibiotics suspension for their children with URTI and their educational level ( $p \leq 0.019$ ) as there were half of the studied mothers who completed their diplom education (50.0%) had satisfactory practices in comparison with one quarter of the studied mothers who completed their university education (25.0%) had unsatisfactory practices.

**Table (1):** Distribution of socio-demographic characteristics of the studied mothers and their children:

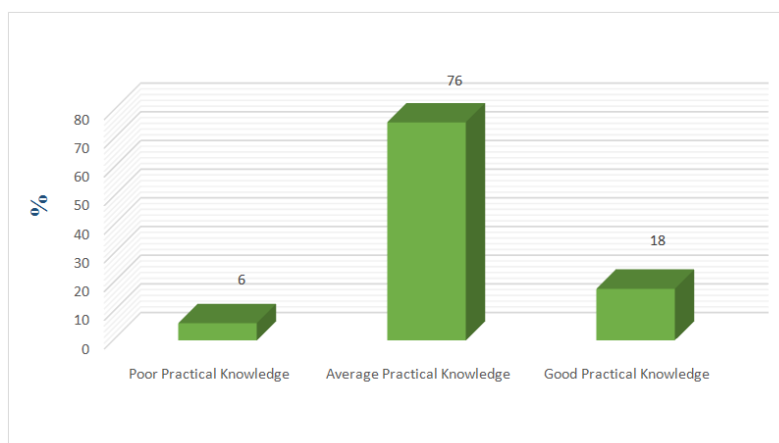
Mothers' Socio-demographic characteristics		No=100	
		No.	%
Age in years	<20ys	6	6
	20-30ys	61	61
	>30ys	33	33
	<b>Mean <math>\pm</math> SD = 28.73 <math>\pm</math> 4.55</b>		
Marital status	Married	98	98
	Divorced	1	1
	Widowed	1	1
Residence	Rural	75	75
	Urban	25	25
Number of siblings	One child	22	22
	2-3 child	69	69
	>3 child	9	9
Educational level	Illiterate	2	2
	Read and write	8	8
	Diplom	49	49
	Bachelor degree	41	41
Occupation	Working	33	33
	House wife	67	67
Income	Enough	71	71
	Not enough	29	29

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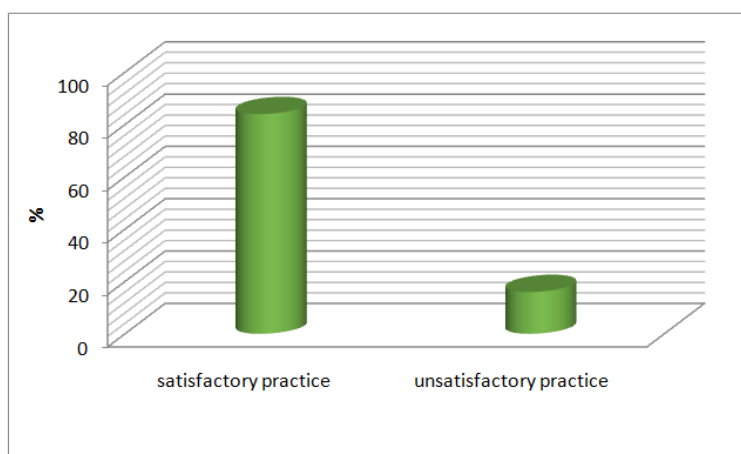
<b>Access to health services</b>	Excellent	11	11
	Very good	19	19
	Good	61	61
	Bad	9	9
<b>Children socio-demographic characteristics</b>		<b>No=100</b>	
		<b>No.</b>	<b>%</b>
<b>Age in Years</b>	<b>Mean <math>\pm</math> SD = 3.76 <math>\pm</math> 2.41</b>		
<b>Gender</b>	Boy	49	49
	Girl	51	51
<b>Birth Order</b>	First	47	47
	Second	30	30
	Third	18	18
	>Third	5	5



**Figure (1):** Total mothers' knowledge about antibiotics.



**Figure (2):** Total mothers' practical knowledge regarding use of antibiotics for their children with URTI.



**Figure (3):** Total mothers' practices regarding giving antibiotic suspension for their children with URTI.

**Table (2):** Relationship between total score of the studied mothers' knowledge about antibiotics and their socio-demographic characteristics:

Mothers' Knowledge		No=100						Test of Significance	
		Good N=5		Average N=31		Poor N=64			
		No.	%	No.	%	No.	%	$\chi^2$	P
Mothers' age	<20 years	0	0	1	3.23	5	7.81	2.518	0.641
	20-30 years	3	40	22	70.96	36	56.25		
	>30 years	2	60	8	25.81	23	35.94		
Marital Status	Married	5	100	31	100	62	96.88	1.148	0.887
	Divorced	0	0	0	0	1	1.66		
	Widowed	0	0	0	0	1	1.66		
Residence	Rural	1	20	20	64.52	54	84.38	12.884	0.002*
	Urban	4	80	11	35.48	10	15.62		
Number of Siblings	One child	2	40	8	25.81	12	18.75	3.794	0.435
	2-3 child	3	60	22	70.96	44	68.75		
	>3 child	0	0	1	3.23	8	12.50		
Educational Level	Illiterate	0	0	0	0	2	3.13	73.538	≤0.001*
	Read and write	0	0	0	0	8	12.50		
	Diplom	0	0	1	3.23	48	75		
	University	5	100	30	96.77	6	9.37		
Occupation	Working	4	80	19	61.29	10	15.62	24.956	≤0.001*
	House Wife	1	20	12	38.71	54	84.38		
Income	Enough	4	80	24	77.42	43	67.19	1.269	0.530
	Not Enough	1	20	7	22.58	21	32.81		
Health Services Access	Excellent	0	0	3	9.68	8	12.50	3.266	0.775
	Very Good	1	20	4	12.91	14	21.88		
	Good	3	60	22	70.96	36	56.25		
	Bad	1	20	2	6.45	6	9.37		

(\*) Statistically significant at p ≤ 0.05

**Table (3):** Relationship between total score of the studied mothers' practical knowledge regarding use of antibiotics for their children with URTI and their socio-demographic characteristics:

Mothers' total practical knowledge		No=100						Test of Significance	
		Good N=5		Average N=31		Poor N=64			
		No.	%	No.	%	No.	%	$\chi^2$	P
Mothers' age	<20 years	1	5.56	4	5.26	1	16.67	1.341	0.854
	20-30 years	11	61.11	47	61.84	3	50		
	>30 years	6	33.33	25	32.90	2	33.33		
Marital Status	Married	18	100	75	98.68	5	83.33	16.125	0.003*
	Divorced	0	0	1	1.32	0	0		
	Widowed	0	0	0	0	1	16.67		
Residence	Rural	11	61.11	59	77.64	5	83.33	2.355	0.308
	Urban	7	38.89	17	22.36	1	16.67		
Number of Siblings	One child	3	16.67	18	23.68	1	16.67	1.875	0.759
	2-3 child	14	77.77	50	65.79	5	83.33		
	>3 child	1	5.56	8	10.53	0	0		
Educational Level	Illiterate	0	0	1	1.32	1	16.67	11.817	0.066
	Read and write	0	0	8	10.53	0	0		
	Diplom	8	44.44	37	48.68	4	66.66		
	University	10	55.56	30	39.47	1	16.67		
Occupation	Working	8	44.44	25	32.90	0	0	4.022	0.134
	House Wife	10	55.56	51	67.10	6	100		
Income	Enough	14	77.77	55	72.37	2	33.34	4.605	0.100
	Not Enough	4	22.23	21	27.63	4	66.66		
Health Services Access	Excellent	2	11.11	9	11.84	0	0	6.769	0.343
	Very Good	6	33.33	13	17.11	0	0		
	Good	9	50	46	60.52	6	100		
	Bad	1	5.56	8	10.53	0	0		

(\*) Statistically significant at p ≤ 0.05

**Table (4):** Relationship between total score of the studied mothers' practices regarding giving antibiotic suspension for their children with URTI and their socio-demographic characteristics:

Mothers' practices		N=100				Test of Significance	
		Satisfactory Practice N=84		Unsatisfactory Practice N=16			
		No.	%	No.	%	$\chi^2$	P
Mothers' age	<20 years	5	6	1	6.2	0.559	0.756
	20-30 years	20	59.5	11	68.8		
	>30 years	29	34.5	4	25		
Marital Status	Married	83	98.8	15	93.7	5.476	0.065
	Divorced	1	1.2	0	0		
	Widowed	0	0	1	6.3		
Residence	Rural	63	75	12	75	Fisher's exact Test	1.000
	Urban	21	25	4	25		
Number of Siblings	One child	18	21.5	4	25	0.238	0.888
	2-3 child	58	69	11	68.8		
	>3 child	8	9.5	1	6.2		
Educational Level	Illiterate	1	1.2	1	6.2	9.898	0.019*
	Read and write	4	4.8	4	25		
	Diplom	42	50	7	43.8		
	University	37	44	4	25		
Occupation	Working	31	36.9	2	12.5	Fisher's exact Test	0.081
	House Wife	53	63.1	14	87.5		
Income	Enough	62	73.8	9	56.2	Fisher's exact Test	0.227
	Not Enough	22	62.2	7	43.8		
Health Services Access	Excellent	10	11.9	1	6.2	3.809	0.283
	Very Good	17	20.2	2	12.5		
	Good	48	57.1	13	81.3		
	Bad	9	10.8	0	0		

(\* ) Statistically significant at p  $\leq$  0.05

#### IV. Discussion

As regards mothers' access to health services, the present study found that more than half of the studied mothers (61.0%) consider their accessibility to health services as good **table (1)**. This finding was in an agreement with **Siddiqui et al., (2014)**, who made a study about knowledge, attitudes and practices of parents regarding antibiotic use in children in Pakistan, reported that (64.0%) of the participants in their study described access to health care system as good. In relation to the studied mothers' total knowledge about antibiotics, the present study indicated that more than half of the studied mothers (64.0%) had poor knowledge while, less than one third of them (31.0%) had average knowledge and only (5.0%) had good knowledge **figure (1)**. This poor knowledge may be related to the demographic characteristics of the studied mothers as most of them from rural areas, with diplom education, had a lot of siblings and housewives which assert an educational intervention to promote appropriate use of antibiotics among mothers of children with URTIs. This result is in agreement with **Rahmin et al., (2014)** that reported in their study about parents' knowledge, attitude and practice of antibiotic use for upper respiratory tract infections in children in the United Arab Emirates that more than half of parents (55.0%) had a poor level of knowledge regarding use of antibiotic.

Although more than half of the studied mothers had poor knowledge about antibiotics, the majority of them (84.0%) had satisfactory practices regarding giving antibiotic suspension for their children with URTI **figure (3)**. This contradiction may be attributed to the focus of the health care team on the practical and management aspects of the disorder and missing the knowledge part. It also may be returned to the doctor's limited time or overcrowding in the outpatient clinics that unable doctors to teach the mothers about antibiotics or the child's condition. This finding is supported by **Jafari et al., (2014)** who indicated in their study about the knowledge, attitude and practice of mothers regarding acute respiratory tract infection in children in Tehran, Iran that the study subjects' practice level was relatively high. This could explained by **Soleimani et al., (2016)** that, the presence of many reasons that affect mothers' practices as their educational level which enable them to read or ask about the correct use of antibiotic, their highly awareness about their child's health, availability of health services or resources and training programs that enhance their practices.



The present study findings revealed that there was statistical significant difference between mothers' general knowledge about antibiotics and their residence, educational level and occupation as ( $P \leq 0.05$ ) **table (2)**. These findings could be explained in the light of the fact that mothers with low education level might find the information about antibiotics difficult to comprehend and understand, living in rural areas make them less exposed to well-prepared information available on web sites, magazines or newspapers, including their usage, side effects and indications otherwise insufficient access to health services at the rural residences as there aren't general hospitals or sometime private clinics to seek medical advices or gain knowledge. This finding comes in agreement with **Abasaheed et al., (2009)** who found in their study about self medication with antibiotics by the community of Abu Dhabi Emirate, United Arab Emirates that the geographical locations have been associated with antibiotic misuse and poor knowledge scores. In addition, this finding is in harmony with **Moustafa, (2015)** study about maternal knowledge, attitude and practice on antibiotic use for acute upper respiratory tract infection in children in Zagazig, Egypt that revealed a significant correlation between mother's educational level and their knowledge. Also, this result was similar with **Nesrin et al., (2012)** who reported in their study about mothers' knowledge and practices of managing minor illnesses of children under five years in Jordan that poor knowledge level was detected in mothers with low educational level. This result was supported by **Elberrya et al., (2012)** who reported in their study about evaluation of non-prescribed antibiotic use among children with upper respiratory tract infection in Jeddah, Saudi Arabia that working mothers had better knowledge than housewives regarding antibiotic use.

Finally, the present study showed that there was only a statistical significant difference between mothers' practices regarding giving antibiotic suspension for their children with URTI and their educational level ( $p \leq 0.019$ ), where more than two fifth of the studied mothers who completed their diplom education (43.8%) had unsatisfactory practice in comparison with mothers' who completed their university education (25.0%) **table (4)**. This finding may be explained in the light of the fact that mothers depend on their experience gained from their previous children and frequent exposure to infections. Also, good education helps them understand the importance of compliance with treatment plan that promote better care and faster recovery. In contrast **Jafari et al., (2014)** stated that there wasn't a significant correlation between educational level of the mothers and their practice.

## V. Conclusion

### The results of the present study it can be concluded that:

More than half of the studied mothers (64.0%) had poor knowledge about antibiotics and the majority of them (84.0%) had satisfactory practices. Also, the studied mothers' knowledge is affected by their residence, educational level and occupation. As well as, the studied mothers' practices are affected only by their educational level. While, maternal knowledge and practices is not affected by their age, number of siblings, income and access to health services.

## VI. Recommendations

### In the light of the findings of the current study, the following recommendations are suggested:

- Health educational program for mothers about antibiotic use to improve their knowledge and practices towards the safe use of antibiotics, especially in rural areas.
- Strict enforcement of over-the-counter sale of antibiotics without doctor's prescription.

### Limitations:

- Decrease in cases' number of children having URTIS visited outpatient clinics and treated with antibiotics.
- Unavailability of quiet and suitable environment for interviewing the mothers'.
- Lack of communication between the pediatrician and the researcher due to lack of time for asking about the child's condition.

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