

## **Mothers' Knowledge and Reported Practices Regarding Antibiotics Administration to their Preschool Children with Upper Respiratory Tract Infections**

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### **Abstract**

**Background:** Upper respiratory tract infections are common diseases that are mostly caused by viral infections. Although antibiotics are medications used for the treatment of bacterial infections, antibiotics are the most commonly prescribed and abused drugs for upper respiratory tract infections globally, which can lead to bacterial resistance. **The aim of the present study** was to assess mothers' knowledge and reported practices regarding antibiotics use to their preschool children with upper respiratory tract infections. A descriptive correlational design was utilized to achieve the aim of the study. **Setting:** The study was conducted at outpatient pediatric clinic in Bier El-Abed central hospital, North Sinai, on 220 mothers who have preschool children suffering from upper respiratory tract infections by using nonprobability purposive sampling method. Data was collected using structured interviewed questionnaire to get data regarding mothers' and their children with upper respiratory tract infections. **Results:** Less than half of the studied mothers have unsatisfactory level of knowledge and less than two thirds of the studied mothers have unsatisfactory level of reported practices regarding antibiotics use to their preschool children suffering from upper respiratory tract infections. **Conclusions:** There was a statistically significant positive correlation between mothers' knowledge and their reported practices. **Recommendations:** Educational workshops were required for mothers to enhance their knowledge and practices regarding antibiotics use to their children.

**Keywords:** Antibiotics, Preschool children, Upper Respiratory Tract Infections.

### **1. Introduction**

Upper respiratory tract infections (URTIs) are one of the major causes of minor illnesses caused by an acute infection of sinuses, middle ear, pharynx, epiglottis, larynx, and trachea. This commonly includes common cold, nasal obstruction, sore throat, tonsillitis, pharyngitis, laryngitis, sinusitis, and otitis

media (*Mustafa et al., 2020*). The majority of URTIs are self-limited conditions that just require supportive care and symptomatic treatment. (*Alzaid et al., 2020*). Preschool children are susceptible to six or eight episodes of these diseases each year, which are mostly caused by viral infections and sometimes by bacterial infections. (*Vutskits*

*& Davidson, 2020).*

URTIs are the most common infections associated with antibiotic abuse, even though most of them are viral in nature and using antibiotics excessively does not lessen the possibility of serious consequences. (*Zhao et al., 2020; El Feghaly et al., 2020).*

In many countries, antibiotics are easily obtained over-the-counter and without a prescription, which motivates mothers to give their children excessive and inappropriate dosages of the medications when they feel sick but don't have bacterial infections. (*Spellberg, 2020).* The abuse of antibiotics has sped up the emergence and spread of antibiotic-resistant bacteria, which are more hazardous and challenging to treat than drug-sensitive germs. According to World Health Organization report (*WHO, 2014*), the yearly death rate attributed to antibiotics resistance in the United States and Europe is greater than 50,000 and global deaths were estimated to rise to 10 million by 2050, with nearly half arising from Asia (*Huang et al., 2021).*

Once penicillin was discovered in 1945, Alexander Fleming cautioned the public that those who abused the medication were "morally accountable" for the deaths of patients who had bugs resistant to the

antibiotic, which the medication could no longer treat. The last time we heard a request for antibiotics was more than 70 years ago. Every person who uses antibiotics affects others' capacity to get them as a beneficial medicine (*Spellberg, 2020).*

It is crucial to persuade physicians to avoid administering antibiotics because there is no discernible reduction in the healing duration for frequent, uncomplicated URTIs while taking them. Maternities need to be provided with the necessary information to minimize the amount of time they spend using antibiotics needlessly. Pediatric nurses not only administer medicines but also play a vital role in relaxing mothers and teaching them how to treat minor URTIs by utilizing decongestants, antipyretics, and adequate fluid delivery. (*Perera et al., 2021).* Also; Mother education on the proper timing and administration of antibiotics, as well as ways to minimize any potential negative effects from abuse or overuse of the medication, should be a top priority for pediatric nurses. (*Paul et al., 2014).*

#### **Significance of the Study:**

Upper respiratory tract infections are common and recurrent infections in preschool children. Although most URTIs are viral in

origin and antibiotics are not justified to reduce the risk of serious complications and not required in most cases, URTIs are the most common diseases associated with excessive antibiotics use (*Huang et al., 2021*). Nonspecialized physicians in Egypt prescribed antibiotics for more than half (53-82%) of the pediatric cases, and most (91.7%) of these prescriptions were inappropriate (*Amin et al., 2022*). Inappropriate use of antibiotics causes antibiotic resistance which negatively affects the condition of preschool children and their course of treatment (*Byrne et al., 2019*). So, this study will be conducted to assess the mothers' knowledge and reported practices regarding antibiotics use to their preschool children who suffer from upper respiratory tract infections.

## **2. The Aim of the study:**

This study aimed to assess mothers' knowledge and reported practices regarding antibiotics use to their preschool children with upper respiratory tract infections.

### **Research questions:**

1. What is the mothers' knowledge regarding antibiotics for their preschool children with upper respiratory tract infections?

2. What are the mothers' reported practices regarding antibiotics administration for their preschool children with upper respiratory tract infections?
3. What's' the relationship between mothers' reported practices and their knowledge regarding antibiotics administration for their preschool children with upper respiratory tract infections?

### **Research question:**

1. Identify the mothers' knowledge regarding antibiotics for their preschool children with upper respiratory tract infections.
2. Assess the mothers' reported practices regarding antibiotics administration for their preschool children with upper respiratory tract infections.
3. Find out the relationship between mothers' reported practices and their knowledge regarding antibiotics administration for their preschool children with upper respiratory tract infections.

## **3. Subject and Method**

### **Study design:**

A descriptive correlational design was utilized for the current study.

**Study setting:**

The study was conducted at the outpatient pediatric clinic in Bier El-Abed central hospital. Bier El-Abed city is one of six centers in North Sinai governorate. Bier EL-Abed city has one central hospital which serves Bier EL-Abed city and twenty-four villages belonging to it. So, Bier El-Abed central hospital serves a large number of patients and covers the two types of communities (rural and urban).

**Target population:**

Mothers of preschool children whose children were suffering from upper respiratory tract infections and attended to the outpatient pediatric clinic in Bier EL-Abed central hospital during the data collection period (from the beginning of February 2021 to the end of July 2021). Participants who meet the exclusion criteria and those who completed the pilot questionnaire were excluded.

**Sample equation:**

The number of subjects enrolled in this study was estimated according to the following equation: (*Sahai & Khurshid, 1996*).

$$n = t^2 \times p(1 - p)/m^2$$

Where:

n = the sample size

t =confidence level at 95% (standard value 1.96)

p = is estimated prevalence in the study area = 0.17

m =margin of error at 5% (standard value of 0.05)

Prevalence was estimated from actual attendance at the outpatient pediatric clinic in Bier EL-Abed central hospital over 12 months from 1 January 2019 to 31 December 2019. The prevalence was estimated by dividing the average number of preschool children aged from 3 to 5 years attending to the outpatient clinic with URTIs per month (247) by the average number of all children attending to the clinic with different diagnosis per month (1453).

$$\text{Prevalence} = 247/1453 = 0.169 \approx 0.17$$

**By applying the previous figures to the equation, the sample size was:**

$$n = \frac{(1.96)^2 \times 0.17(1-0.17)}{(0.05)^2} = 216.7 = 217 \approx 220$$

**Sample size:**

The calculated sample size was 220 mothers of preschool children whose children

were suffering from upper respiratory tract infections and attended to the previously mentioned setting.

**Tool of data collection:**

A structured interviewed questionnaire was used in this study; it was adapted from (*Panagakou et al., 2011*) after reviewing the related literature. Some new questions were developed and added by the researcher to the tool. Then, the tool was translated into Arabic Language using backward translation method. The average time to conduct the interview was estimated to be 20-30 minutes. All questions were close ended questions; Most of them were “Yes/No” or Likert scale in type. The questionnaire was consisted of three parts as the following:

**Part1: Socio demographic data about mothers and their sick child:**

It included 10 questions about: mothers' age, level of education, residence place, marital status, occupation, family monthly income, number of children, age of sick child, gender of sick child, and child's order among his siblings.

**Part 2: Mothers' knowledge about antibiotics nature, antibiotics use and antibiotic resistance:**

It included 20 questions to assess mothers' knowledge about antibiotics nature, antibiotics use and antibiotics resistance such as: causative agents of URTIs, sources of information about antibiotics, effect of antibiotics on bacteria and virus, knowledge about the use of antibiotic if the child suffers from fever, side effects of antibiotics, use of antibiotics to reduce the complications of the URTIs, unnecessary use of antibiotic and the emergence of bacterial resistance.

**Scoring system:**

For knowledge items, 20 items, the correct responses were scored (1) and the incorrect were scored (0). The total knowledge scores were 20 scores; scores of items were summed up and the total was divided by the number of the items, giving a mean score for the part. These scores were converted into a percentage score. Knowledge was considered satisfactory if the percentage score was 60% or more and unsatisfactory if less than 60%.

**Part 3: Mothers' reported practices regarding use of antibiotics:**

It included 18 questions to assess mothers' reported practices regarding use of antibiotics such as: how to use antibiotics for preschool children with upper respiratory tract

infections such as dose, route of administration, parents' self-medication, The reasons for giving child an antibiotic without consulting the pediatrician, reasons for changing type or dose of antibiotic without consultation, monitoring temperature before giving antibiotics, and when to stop antibiotic course.

**Scoring system:**

For reported practices items, 18 items, the correct responses were scored (1) and the incorrect were scored (0). The total practices scores were 18 scores; the scores of items were summed up and the total was divided by the number of items, giving a mean score for the part. These scores were converted into a percentage score. Reported practices were considered satisfactory if the percentage score was 60% or more and unsatisfactory if less than 60%.

**Preparatory phase:**

A review of the past and the current related literatures covering upper respiratory tract infections in preschool children and antibiotics use by the mothers to their children was done using available books, articles, periodicals, magazines, and internet search to get acquainted with the research problem and develop the study tool.

**Tool validity and reliability:**

The tool of the study was given to five experts in the field of pediatric nursing to test the content validity of the tool and clarify the sentences as well as the appropriateness of content. Reliability of the tool was tested by using Cronbach's Alpha to ensure the internal consistency of the tool. The reliability (internal consistency) of the whole questionnaire was 0.55.

**Pilot study:**

A pilot study was carried out after the development of the study tool and before starting the data collection. It was conducted on 10% (22 mothers) of the sample to test the clarity, objectivity, and feasibility of the tool, and determine the time required to fill the data collection tool (20-30 minutes). Necessary modifications were done, and those included in the pilot were excluded from study sample.

**Field work:**

After obtaining permissions from the director of the hospital and the director of outpatient clinics to proceed with the proposal study, the researcher initiated the process of data collection. The actual field work was carried out over a period of 6 months (from the beginning of February 2021 to the end of

July 2021). The researcher was present at the outpatient pediatric clinic in Bier EL-Abed central hospital two days per week (Sunday and Wednesday from 8 Am to 1 Pm) to collect data from mothers of preschool children suffering from upper respiratory tract infections. Through an individual interview of each mother during their visit to the clinic, the mother was asked to answer the questionnaire. The time spent to fill it was 20-30 minutes for each mother.

#### **Ethical considerations:**

Written consent was obtained from each mother prior to her participation in the study after a full explanation of the aim and nature of the study. The researcher assured voluntary participation, anonymity and confidentiality of the gathered data and it will be used only for the purpose of the study. Also, the participating mothers assured that they have the right to withdraw at any time from the study without any effect on the care provided by outpatient pediatric clinic.

#### **Data analysis:**

The collected data was organized, revised, tabulated, and analyzed using number and

percentage distribution. Statistical analysis was done by computer using statistical package of the social sciences (SPSS) software program version 20. The following statistical techniques were used for data analysis: descriptive statistics, frequency, percent distribution arithmetic mean. Qualitative categorical variables were compared using the chi-square test and T-test. Statistical significance was considered at P-Value < 0.05.

#### **4. Results**

**Table (1):** Shows that about half (50.5%) of the studied mothers were between the ages of 30 and less than 40 years. More than half (51.4%) of the studied mothers lived in the urban area. The majority (87.8%) of the studied mothers were married and the family monthly income level of less than three quarters (71.4%) of them were enough.

**Table (2):** Shows that more than three quarters (78.2%) of the studied mothers have a correct knowledge regarding that antibiotics kill bacteria. More than half (54.5%) of the studied mothers have corrected knowledge regarding that antibiotics aren't effective with all types of upper respiratory tract infections. More than two thirds (68.2%) of the studied



mothers have incorrect knowledge regarding that antibiotics reduce the complication of URIs. Less than two thirds (61.8%) of the studied mothers have correct knowledge regarding that the effect of antibiotics is affected by other medications; while less than half (44.1%) of the studied mothers have correct knowledge regarding that the effect of antibiotics is affected by food. More than two thirds (67.3%) of the studied mothers have correct knowledge regarding that the antibiotic shouldn't be given in all cases that the child is suffering from high temperature.

**Figure (1):** Illustrates percentage distribution of the studied mothers' total knowledge mean scores and answers the first research question. This figure shows that more than half (51.8%) of the studied mothers have satisfactory level of knowledge regarding antibiotics use to their preschool children suffering from upper respiratory tract infections.

**Table (3):** Shows that more than two thirds (70.5%) of the studied mothers visit the pediatrician before 3 days from the beginning of symptoms of upper respiratory tract infections. Concerning the time that the studied mothers decide to stop using the antibiotic for their children, this table also shows that more than one quarter (29.5%) of

the studied mothers stop giving her child an antibiotic after the prescribed time for the treatment has ended. Also, this table represents that more than three quarters of the studied mothers said that they read the internal leaflet attached to the antibiotic box before using it and stick to the schedule for giving antibiotics as required (77.7% & 79.5% respectively).

**Table (4):** Shows that about two thirds (65.9%) of the studied mothers take care of sensitivity test when using antibiotic injection. Moreover, only 11.8% of children had allergy from antibiotics. Regarding the action of those mothers whose children have allergy from any of antibiotics, more than two fifths (46.2%) of them said that they replace the antibiotic with another one, more than one quarter (30.7%) of them said that they stop antibiotic and consult pediatrician, while less than one quarter (23.1%) of them said that they give anti allergic medications.

**Figure (2):** Clarifies percentage distribution of the studied mothers' total reported practices scores about antibiotic use and answers the second research question. This figure shows that more than half (63.6%) of the studied mothers have unsatisfactory level of practice regarding antibiotics use to their



children suffering from upper respiratory tract infections.

**Table (5):** Shows that there was statistically significant relation between total level of knowledge and age, occupation, and level of education of the studied mothers where p value is (.04, .001 and .007 respectively).

**Table (6):** Illustrates that there was statistically significant relation between total level of reported practices and occupation, level of education and income of the studied mothers where p value is (.02, .000 and .001 respectively), while there was no statistically significant relation between total level of reported practices and age of the studied mothers where p value is (.409).

**Table (7):** Illustrates correlation between total knowledge and total reported practices of the studied mothers regarding antibiotics use to their preschool children and answers the third research question. This table shows that there was statistically significant positive correlation between mothers' knowledge and their practice with  $r .225$ ;  $P \text{ value} < .001^*$

## 5. Discussion

Upper respiratory tract infections are caused by infections which involve the upper

respiratory tract including the nose, sinuses, pharynx, larynx and subglottic area of the trachea (*Godman et al., 2019; Thomas et al., 2020*). URTIs are very common in childhood, with an annual incidence of up to 6 to 8 episodes in preschool children (*Vutskits & Davidson, 2020*). URTIs are usually self-limited diseases that require only supportive management and symptomatic treatment (*Alzaid et al., 2020*). Although most URTIs are viral in origin and antibiotics are not justified to reduce the risk of serious complications, URTIs are the most common diseases associated with excessive antibiotics use (*El Feghaly et al., 2020; Zhao et al., 2020*).

The inappropriate prescription of antibiotics by doctors and the misuse of antibiotics by public both are responsible for developing bacterial resistance (*Abdel Jalil et al., 2018; Hammour et al., 2018*). So, this study was conducted to assess the mothers' knowledge and reported practices regarding antibiotics use to their preschool children who suffer from upper respiratory tract infections.

Regarding the studied mothers' knowledge about the effect of antibiotics on bacteria and viruses, this study showed that more than three quarters of studied mothers

have correct knowledge regarding that antibiotics kill bacteria, and less than half of the studied mothers have incorrect knowledge regarding that antibiotics kill viruses. A study, supported the findings of the present study, was done by **Karanth et al., (2020)** about “Assessment of parental knowledge, attitude and practice towards antibiotics use in children” revealed that more than half of the studied parents said that antibiotics are used mainly to treat infections caused by bacteria. On the other hand, the Indian study which was done by **Ivanovska et al., (2018)** about “Change in parental knowledge, attitudes and practice of antibiotics use after a national intervention program” reported that the majority of respondents agreed that antibiotics have no role against viruses.

The current study showed that more than one quarter of the studied mothers incorrectly know that antibiotics are effective with all types of upper respiratory tract infections. This result was agreed with **Alturaigi et al., (2021)** who found in their study about “Knowledge and attitude towards antibiotics use among mothers attending pediatric clinics in king Saud medical city, Riyadh, Saudi Arabia” that less than half of the participating mothers considered antibiotics are the first

and best medication to treat URTIs in children.

In the present study more than two thirds of the studied mothers incorrectly know that antibiotics reduce the complication of URTIs. This finding agrees with a study conducted by **Alrafiaah et al., (2017)** about “Are the Saudi parents aware of antibiotic role in upper respiratory tract infections in children?” and found that about two thirds of the studied parents agree with that antibiotic use can prevent complications from URTIs.

The findings of the current study revealed that less than two thirds of the studied mothers have correct knowledge regarding that the effect of antibiotics is affected by other medications; while less than half of the studied mothers have correct knowledge regarding that the effect of antibiotics is affected by food. This study was supported with **Mukattash et al., (2020)** who conducted a study about Parental self-medication of antibiotics for children in Jordan and found that less than two thirds of the studied parents agreed with that antibiotics interact with other medications, and more than one third of those parents agreed with that antibiotics should be taken before meals.

In the present study less than three quarters of the studied mothers correctly know that antibiotics have side effects. This finding supported by **Mohammed & Abdelrahim, (2021)** in their study about “Evaluation of practice, attitude and knowledge about irrational use of antibiotics for common cold infection in Sudan” and they found that more than two thirds of participants know about side effects of antibiotics.

The findings of the present study showed that more than two thirds of the studied mothers correctly know that antibiotics shouldn't be given in all cases that the child is suffering from high temperature, and less than three quarters of the studied mothers incorrectly know that the child will recover faster if he takes antibiotics since the onset of symptoms, if he has a flu like symptoms. The findings of the current study are supported by **Alsuhaibani et al., (2019)** who conducted a study about “Parents awareness toward antibiotics use in upper respiratory tract infection in children in Al-Qassim region, Saudi Arabia” where they mentioned that only less than fifth of parents believed that any child with a fever should be given antibiotics. But the same study is different with the

current study in the second point, where **Alsuhaibani et al., (2019)** said that more than two thirds of parents expect that antibiotics won't fasten the time of recovery from flu symptoms.

The present study reported that more than half of the studied mothers have satisfactory level of knowledge regarding antibiotics use to their children suffering from upper respiratory tract infections. These results come in the reverse line with **Nasimfar & AmuzMehr, (2018)** who conducted a study about “Evaluation of knowledge, attitude, and practice of parents on the use of antibiotics for acute upper respiratory tract infections in children admitted to Motahari Hospital of Urmia in 2017–2018” and found that less than half of parents have moderate level of knowledge.

Regarding the studied mothers' practices about antibiotics for URTIs to their preschool children, the finding of the current study showed that more than two thirds of the studied mothers visit the pediatrician before 3 days from the beginning of symptoms of upper respiratory tract infections. This finding come in agreement with **Faidah et al., (2019)** who conducted a study about “Parents' self-directed practices towards the use of

antibiotics for upper respiratory tract infections in Makkah, Saudi Arabia”, and found that less than two thirds of the participants stated that they would visit a pediatrician within 1–2 days of their child developing symptoms of URTIs, and less than one fifth of them would contact their pediatrician on the same day.

Concerning the time that the studied mothers decided to stop using the antibiotic for their children, the present study revealed that more than two thirds of the studied mothers didn't complete the course of antibiotics for their children. A study performed by **Hajjar et al., (2017)** who conducted a study about Antibiotics use and misuse in upper respiratory tract infection patients: Knowledge, attitude and practice analysis in University Hospital, Saudi Arabia and revealed similar findings, as they found that more than two thirds of parents didn't complete the course of antibiotics for their children.

The present study revealed that more than two thirds of the studied mothers have unsatisfactory level of reported practices regarding antibiotics use to their children suffering from URTIs. This comes in the contrast line against **Nasimfar &**

**AmuzMehr, (2018)** who found that less than two thirds of parents had reported good practices regarding antibiotics use to their children suffering from URTIs.

According to the relationship between the studied mothers' total level of knowledge and their age, the present study found that there was a statistically significant relation between the total level of mothers' knowledge and their age, wherein mothers aged (20 <40) years were more knowledgeable than the other age groups. From the researcher's point of view this result may be due to the fact that young mothers have the ability to acquire knowledge better than old mothers and they also have the ability to read or use the internet and search for the information they need. Also, it's expected that mothers <20 years had a low educational level and as a result their level of knowledge was unsatisfactory. This finding come in a disagreement with **Vaz et al., (2015)** in his study about “Prevalence of parental misconceptions about antibiotic use” in which they reported that individuals of younger age were less likely to answer knowledge questions about antibiotics use correctly. Another study opposes the current study which was conducted by **Okide et al., (2020)** who reported in their study about

Parents' Knowledge, Attitudes and Use of Antibiotics in Upper Respiratory Infections in Nigerian Children that older parents aged more than 30 years were significantly more knowledgeable about antibiotics than their corresponding counterparts.

Concerning the relation between occupation of the studied mothers and their total level of knowledge, the present study revealed that there is a high statistically significant relation between the total level of mothers' knowledge and their occupation. Accordingly, whenever the mother is an employee and her job related to medical field, whenever she has high level of knowledge about URIs and antibiotics. From the researcher's point of view, the finding of the current study may be due to that the related medical field employed mothers have the chance to acquire more information as a result of their occupation nature which further reflects on the level of knowledge.

According to relation between demographic characteristics of the studied mothers and their total level of reported practices regarding antibiotics use, the current study revealed that there was no statistically significant relation between total level of reported practices and age of the studied

mothers, and improper practices were common in all age groups. The current result was different with **Salama et al., (2018)** who reported in their study about "Parents knowledge, attitude and practice of antibiotics use for upper respiratory tract infections in children: a cross-sectional study in Ras Al khaimah, United Arab Emirates" that improper practices of antibiotics use were significantly common among mothers of younger ages (18-30 years old).

The current study also found that there was a statistically significant relation between total level of reported practices and occupation, level of education and income of the studied mothers. The findings of the current study were supported by **Salama et al., (2018)** who reported that improper practices of antibiotics use were significantly common among low-income group and primary school and mothers who were employed had higher level of practices than housewives.

Regarding correlation between total knowledge level of the studied mothers and their total level of reported practices, the finding of the current study revealed that there was a statistically significant positive correlation between mothers' total level of

knowledge and their total level of reported practices.

## **6. Conclusion:**

Based on the findings of the present study, it can be concluded that more than half of the studied mothers have a satisfactory level of knowledge, and more than one third of them have satisfactory level of reported practices regarding antibiotics use to their preschool children suffering from upper respiratory tract infections. There was a statistically significant positive correlation between mothers' education and their total level of knowledge. Also, there was a statistically significant positive correlation between mothers' total level of knowledge and their total level of reported practices with every one unit increase in total level of knowledge, the total level of reported practices increases.

## **7. Recommendations:**

### **A. Health care workers:**

1. Training for healthcare providers and pharmacists about proper antibiotic prescription should be considered as well as holding retraining courses for physicians for not prescribing antibiotics for viral URIs.

2. Careful supervision of pharmacies to prevent the sale of antibiotics without physician's prescription.
3. Health education could be conducted through physicians, pharmacists, nurses, mass media, and community approaches to collaborate in increasing public awareness of antibiotic use and consequently to reduce self-medication with antibiotics.

### **B. Mothers:**

1. Periodic educational workshops should be organized for mothers; the contents of health education should include the basic concepts of antibiotics, the appropriate indications and administration, and the potential hazards of self-medicating children with antibiotics, completion of the full course of prescribed antibiotics and the discontinuation of use of leftover antibiotics in the home. This can play a vital role in enhancing the knowledge and practice of mothers.
2. Healthy communication with mothers through mass media will be useful in enhancing and promoting changes in mothers' knowledge and practice towards use of antibiotics to their children,

especially among mothers with low educational level.

1. Comprehensive educational programs about proper antibiotics use were required for mothers as they are the main care givers for children.

**C. Researchers:**

**Table (1):** Percentage distribution of the studied mothers’ demographic characteristics (n=220).

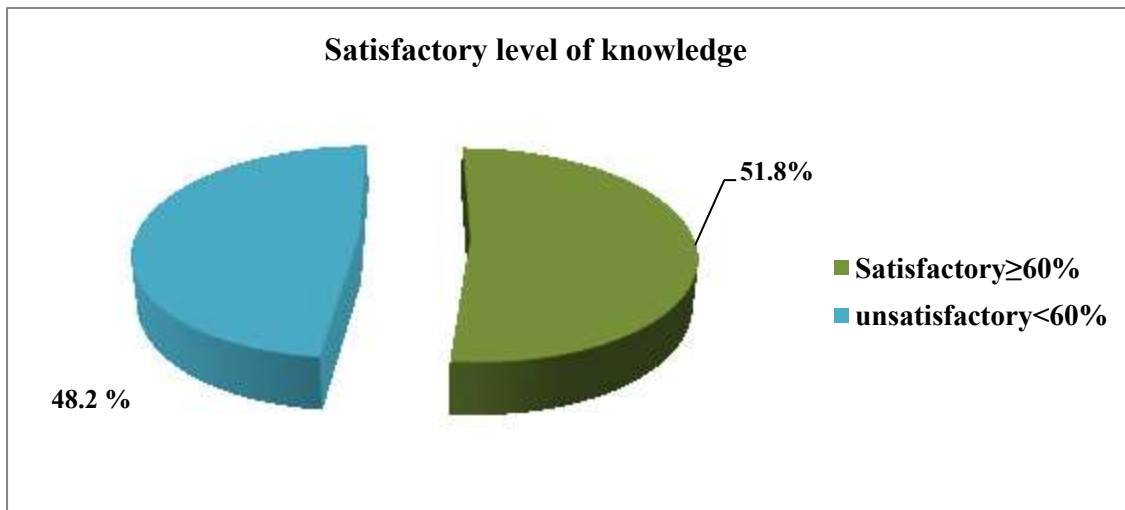
Mothers’ demographic characteristics	N	%
<b>Age (Years)</b>		
< 20	5	2.3
20 < 30	68	30.9
30 < 40	111	50.5
40 ≥50	36	16.3
Mean ±SD	32.68±7.26	
Range	18-55	
<b>Residence</b>		
Rural	107	48.6
Urban	113	51.4
<b>Marital status</b>		
Married	193	87.8
Divorced	19	8.6
Widowed	8	3.6
<b>Family Monthly Income</b>		
Enough	157	71.4
Not Enough	63	28.6
<b>Occupation</b>		
Related medical field	22	10
Not related	44	20
Not working	154	70



**Table (2):** Percentage distribution of the studied mothers' knowledge regarding antibiotic nature & use (n=220)

Knowledge regarding antibiotic nature & use	Correct		Incorrect		I don't know	
	No	%	No	%	No	%
1. Antibiotics kill bacteria	172	78.2	19	8.6	29	13.2
2. Antibiotics kill viruses	100	45.5	77	35.0	43	19.5
3. Antibiotics kill bacteria that normally live inside the digestive system	107	48.6	57	25.9	56	25.5
4. Bacteria that normally live inside the digestive system are considered good for the child health	117	53.2	47	21.3	56	25.5
5. Antibiotics are effective with all types of upper respiratory tract infections	61	27.8	120	54.5	39	17.7
6. Antibiotics reduce the complications of upper respiratory infections	150	68.2	30	13.6	40	18.2
7. The effect of antibiotic is affected by other medicines	136	61.8	50	22.7	34	15.5
8. The effect of oral antibiotics is affected by food	97	44.1	88	40.0	35	15.9
9. Antibiotics have side effects	159	72.3	40	18.2	21	9.5
10. The child should be given the antibiotics in any case that the child is suffering from high temperature	52	23.6	148	67.3	20	9.1
11. When switching an antibiotic to another antibiotic, you mustn't give antibiotics for one day	75	34.1	91	41.4	54	24.5
12. The child will recover faster if he takes antibiotics since the onset of symptoms, if he has flu like symptoms.	162	73.6	31	14.1	27	12.3
13. Repeated use of antibiotic makes its effect less beneficial in the future	161	73.2	31	14.1	28	12.7
<b>Average percent</b>	<b>54.6</b>		<b>29.3</b>		<b>16.1</b>	

**Figure (1):** Percentage distribution of the studied mothers' total knowledge scores (n=220)



**Table (3):** Percentage distribution of the studied mothers' reported practices about antibiotics for upper respiratory tract infections to their preschool children (Part1, n=220)

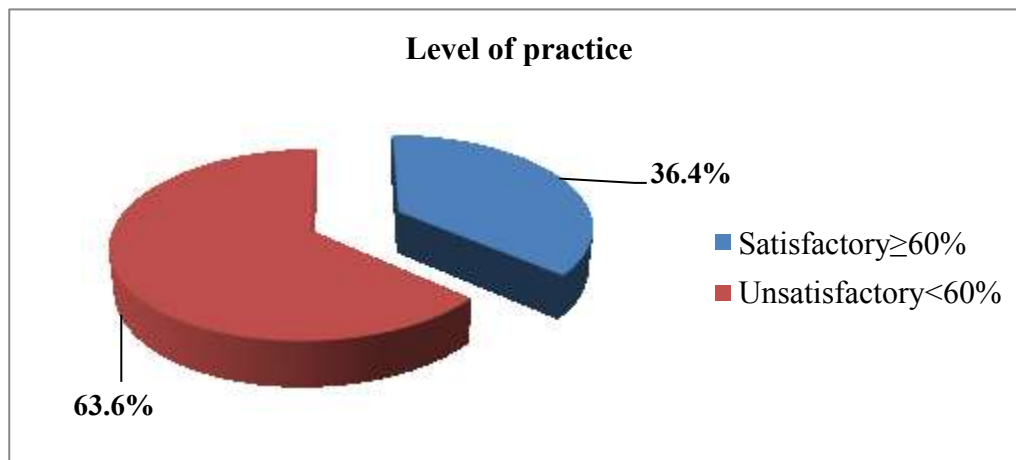
Mothers' reported practices	N	%
<b>1. Number of days before pediatrician visit for child suffering from runny nose, cough, high temperature.....etc.</b>		
a) $<3^*$	155	70.5
b) 3:7	33	15
c) $>7$	32	14.5
<b>2. When you stop giving your child an antibiotic</b>		
a) After several days, regardless of the outcome	9	4.1
b) Immediately after the symptoms disappear	49	22.3
c) Several days after the symptoms disappear	26	11.8
d) After the antibiotic amount is over	36	16.4
e) After the prescribed time for the treatment has ended	65	29.5
f) Once the child feels improved	35	15.9
<b>3. Have you read the internal leaflet attached to the antibiotic box before?</b>		
a) Yes	171	77.7
b) No	49	22.3

4. Do you stick to the schedule for giving antibiotics as required?		
a) Yes	175	79.5
b) No	45	20.5

**Table (4):** Percentage distribution of the studied mothers’ reported practices about sensitivity test before using antibiotics for upper respiratory tract infections to their preschool children (n=220).

Mothers’ reported practices	N	%
<b>1. When using antibiotic injection, do you take care of a sensitivity test?</b>		
a) Yes	145	65.9
b) No	75	34.1
<b>2. Does your child have allergy from any of antibiotics?</b>		
a) Yes	26	11.8
b) No	194	88.2
<b>3. If yes what is your action (n=26)</b>		
a) Stop antibiotic and consult pediatrician	8	30.7
b) Replace with another antibiotic	12	46.2
c) Give anti-allergic medication	6	23.1

**Figure (2):** Percentage distribution of the studied mothers’ total reported practices score about antibiotic use (n=220).



**Table (5):** Relations between demographic characteristics of the studied mothers and their total knowledge score (n=220).

Mothers' demographic characteristics	Total knowledge				X <sup>2</sup> (P value)
	Sat.		Unsat.		
	N	%	N	%	
<b>Mother age (Years)</b>					
a) < 20	1	20	4	80	10.05(.04*)
b) 20 < 30	43	63.2	25	36.8	
c) 30 < 40	56	50.5	55	49.5	
d) 40 ≥ 50	14	38.9	22	61.1	
<b>Occupation</b>					
a) Related medical field	18	81.8	4	18.2	14.02(.001*)
b) Not related	28	63.6	16	36.4	
c) Not working	68	44.2	86	55.8	
<b>Education</b>					
a) Illiterate	5	27.8	13	72.2	14.01(.007*)
b) Can read and write	4	25	12	75	
c) Intermediate education	39	48.7	41	51.3	
d) High average education	26	59.1	18	40.9	
e) High education	40	64.5	22	35.5	

X<sup>2</sup> is chi-square test, P value is **significant <.05**

**Table (6):** Relations between demographic characteristics of the studied mothers and their total reported practices scores regarding antibiotic use (n= 220).

Mothers' demographic characteristics	Total practice				X <sup>2</sup> (P value)
	Sat.		Unsat.		
	N	%	N	%	
<b>Mother age (Years)</b>					
a) < 20	1	20	4	80	2.89(.409)
b) 20 < 30	29	42.6	39	57.4	
c) 30 < 40	40	36	71	64	
d) 40 ≥50	10	27.8	26	72.2	
<b>Occupation</b>					
a) Related medical field	12	54.5	10	45.5	7.87(.02*)
b) Not related	21	47.7	23	52.3	
c) Not working	47	30.5	107	69.5	
<b>Education</b>					
a) Illiterate	2	11.1	16	88.9	26.99(<.000*)
b) Can read and write	2	12.5	14	87.5	
c) Intermediate education	29	36.3	51	63.7	
d) High average education	10	22.7	34	77.3	
e) High education	37	59.7	25	40.3	
<b>Family Monthly Income</b>					
a) Adequate	68	43.3	89	56.7	11.43 (.001*)
b) Inadequate	12	19	51	81	

X<sup>2</sup> is chi-square test, P value is **significant <.05**

**Table (7):** Correlation between total knowledge and total reported practices of the studied mothers regarding antibiotics to their preschool children (n=220).

Items	Total practice	
	Pearson Correlation	Sig. (2-tailed)
<b>Total Knowledge</b>	.255	<.001*

\*Significant<.05

## 8. References

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