Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 6, Issue, 06, pp.7109-7116, June, 2014

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

KNOWLEDGE, BELIEVES, AND PRACTICES REGARDING ANTIBIOTIC USE AND MISUSE AMONG RURAL MOTHERS IN GHARBIA GOVERNORATE

Hanan A., Ebrahim, *Lulah A., Hassan and Samia E., Khaton

Lecturers of Community Health Nursing, Faculty of Nursing, Tanta University, Egypt

ARTICLE INFO

Article History:
Received 04th March, 2014
Received in revised form
19th April, 2014
Accepted 10th May, 2014
Published online 25th June, 2014

Key words:

Antibiotic,
Misuse,
Believes and Practice.

ABSTRACT

Inappropriate use of antibiotics is a significant public health problem. Nevertheless, only few studies have been conducted in Egypt in this area.

The aim of this study was to assess knowledge, believes and practice regarding antibiotic use and misuse among rural mothers in Gharbia governorate.

Material and Method: a cross-sectional design was used. The study was conducted at twenty rural health units in Gharbia governorate. An interview questionnaire was held with 1000 convenient subjects exploring their knowledge, believes, and practices regarding antibiotic use and misuse in a twenty weeks-period.

Results: It was found that the majority of mothers had poor knowledge and bad believes about antibiotics. Nearly about two thirds of them used antibiotic inappropriately. More than half of the studied mothers believed that antibiotics will relive influenza manifestation and may change the doctor if not prescribe antibiotic for them. There was a significant statistical relationship found between mothers' level of education and their score of knowledge, believes, and practice.

Conclusion and Recommendation: Mothers use and misuse of antibiotics was positively correlated with their knowledge and believes. Therefore, addressing this problem will require a combined approach including improved access, legislation, education, and culturally relevant client provider interactions.

INTRODUCTION

Antibiotic therapy has become the focus of growing public attention because of reduced patient safety seen with the inappropriate use of these important agents (Hanan S Ez-Elarab *et al.,* 2009; Andreas Rouusounides *et al.,* 2011; Arch G. Mainous *et al.,* 2008; Abdel Gawad Elmasry *et al.,* 2013). Excessive inappropriate use of antibiotics gives rise to numerous problems, of which antimicrobial resistance is the major one (Ausra Berzanskyte *et al.,* 2006; Cagri Buke *et al.,* 2005; Shehadeh *et al.,* 2012). The inappropriate use of antibiotics may take different forms including the use of antibiotics that have been prescribed for someone other than the individual, taking them or that have been prescribed for the individual for a previous illness; individuals who do not follow directions for use (i.e. stopping the course of medication when symptoms resolve instead of completing the whole course, skipping of doses, reuse of leftover antibiotics and use drugs for too long duration) are also using antibiotics inappropriately (Osama *et al.,* 2012). Other inappropriate uses include prescription by physicians that occurs in response to parental pressure or prescription for diagnosis that are usually Not bacterial in origin such upper respiratory infection, bronchitis or pharyngitis (Cavrell 2009). Such antibiotic-taking behavior can result in insufficient antibiotic exposure for eradicating infectious bacteria and potentially create an environment that promotes antibiotic resistance which is the major one, currently cause for worldwide concern (Ausra Berzanskyte *et al.,* 2006; Osama *et al.,* 2012).

Irrational use is suggested also by previous community-oriented studies as a force driving the occurrence and the spread of antibiotic resistance particularly in the developing and lesser-developed countries (Hanan S Ez-Elarab *et al.,* 2009). The spread of resistance related to the irrational use of antibiotics is a major problem (Cagri Buke *et al.,* 2005). It is estimated that more than 50% of antibiotics worldwide are purchased privately without a prescription, from pharmacies or street vendors in the informal sector (Andreas Rouusounides *et al.,* 2011; Ganchimeg Togoobaatar *et al.,* 2010). The situation in developing countries is of particular concern because the use of antibiotics without medical guidance is largely facilitated by inadequate regulation of the distribution and sale of prescription drugs (Elberry *et al.,* 2012). Over the past decade, the emergence of antibiotic resistance has been recognized as an important public health problem in both developed and developing nations

***Corresponding author: Lulah A., Hassan** Lecturers of Community Health Nursing, Faculty of Nursing, Tanta University, Egypt.*

(http://www.keelpno.gr/en-us/home.aspx). It is evident that antibiotics affect not only the microorganism and the individual patient, but also the population as a whole (Abdel Gawad Elmasry *et al.,* 2013). The incidence of antimicrobial resistance is increasing and represents a serious threat not only to patients who have infections that do not respond to antimicrobial drugs but also to global healthcare systems where it increase the selection pressure on physicians who tend to prescribe newer broad spectrum agents for excessive periods of time. (Abdel Gawad Elmasry *et al.,* 2013; Cagri Buke *et al.*, 2005; Osama *et al.*, 2012)

The effectiveness of the antibiotics in the community and the risk of resistance may be influenced by how they are used by the patient (Elberry *et al.*, 2012). There are many factors influencing antibiotic use include, the higher incidence of infectious diseases in children, lack of access to health care, costs, poor regulatory controls on the use of prescription drugs such as antibiotics, parental knowledge and believes; coupled with low antibiotic knowledge prompting increased self medication with these drugs (Elberry *et al.*, 2012; Storr *et al.,* 2012; WHO 2001). The relationship between antibiotic usage and resistance is strongly supported by data from several studies. Countries with the highest per capita antibiotic consumption have the highest resistance (Admin 2013; Ce´spedes and Larson 2006). According to the latest data from the European Center for Disease Prevention and Control (ECDC), Greece is the country with the second highest rate of antibiotic consumption and only recently a European Commission report indicated that Greece also has the highest over-the-counter antibiotic sales among 27 European Union (EU) countries (Admin 2013). Misuse of antibiotic is considered one of the phenomenon that exist among mothers (Hala Abdullah Hussien Abu Romman 2013). Unfortunately, data regarding endemic antimicrobial resistance and the use of antimicrobials in Egypt, where over-the-counter antibiotic use is common, are unavailable (Azza *et al.,* 2011). Research about knowledge and beliefs among mothers regarding antibiotics and their use is lacking (Azza *et al.,* 2009). Community health nurses can contribute to all elements of strategies to reduce anti microbial resistance (AMR). They contribute as researchers, care providers, educators, infection prevention and health protection specialists and patient advocates (Storr *et al.,* 2012). Nurses play a central role in public health education, and in educating patients on the use of medications and hygienic practices such as "Catch it, bin it, and kill it". These will all contribute to ensuring that antibiotic use is appropriate and effective (Storr *et al.,* 2012; Allender *et al.,* 2010).

Traditionally, Mothers are mostly the main responsible of medication use in Egyptian families. Community health nurses have many opportunities to educate mothers and reinforce messages on antibiotics especially among rural mothers who have low level of education and have less health education facilities and at the same time they assumed the responsibility toward maintenance of health of their families (Storr *et al.,* 2012; Allender *et al.,* 2010; Battle 2009; Ricci 2007). Therefore, this study was designed to survey rural mothers about their knowledge, believes and practices regarding the use and misuse of antibiotics.

The aim of the study was to

a- Assess rural mothers in Gharbia governorate regarding their knowledge, beliefs and practice of antibiotics use and misuse.
b- Determine the influence of mother's knowledge and beliefs on antibiotics use.

Research Questions

1-What do mothers know about antibiotics?
2-What are the beliefs of these mothers about use of antibiotics?
3- How do these mothers use antibiotic?
4-Did the knowledge of the mothers about antibiotics affect their beliefs and use of these agents?

MATERIALS

Design; A descriptive cross-sectional design was used in this study.

Setting; this study was conducted in the rural health units in Gharbia governorate, Egypt. There are 10 districts in Gharbia governorate, the list of all rural health units in the ten districts was obtained from the administration of health affairs in the Governorate. The biggest two rural health units from each district were selected to conduct the study. The total number of the selected rural health units was 20 health units.

Subjects; A convenient sample of one thousand (1000) mothers from the previous settings was included in the study; 50 mother from each rural health unit.

Data collection tool; The survey was conducted using an interview questionnaire sheet which developed by the researchers. The questionnaire included demographic data of the mothers and three main sections which displayed the Knowledge (Section A), beliefs (Section B) and Practices (Section C) and contained 38 questions in total, divided into demographic information (8 questions) include age, education, occupation, family income, health insurance status and using of health care services. Mothers' knowledge (12 questions) addresses questions relevant to the aim of antibiotic use, side effects, use of antibiotic in viral infection, correct use of antibiotics, antibiotic resistance and antibiotic misuse. Mothers' believes (9 questions) addresses mother's believes regarding antibiotic effectiveness in cough or common cold, flu and nasal congestion, attitude toward antibiotic prescription by the doctors and correct use. Mother's practice (9 questions) looked at how and when mothers take or give antibiotics, who prescribe the antibiotic, self use of antibiotic and commitment with doctor's prescriptions.

METHODS

1-Obtaining approvals

Official permission to conduct the study was obtained by the researchers from the administration of health affairs of Elgharbia Governorate and subsequently official letters were

directed to each director of the selected rural health units to facilitate the researchers work in the units.

2-Developing the tools

The structured questionnaire sheet was developed based on literature review. The developed tool was distributed to a jury of 5 academic professors in public health to test their validity. Accordingly corrections and modifications were done. A pilot study was carried out on (about 3% of the target sample) (n= 30 mothers) to test the tool for relevance, clarity and reliability. Data collected from pilot part of the study were excluded from the final data analysis.

3- The actual study

- The collection of the data continued during a period of 20 weeks starting from March till the end of July 2013.
- Informed consent was obtained from the chosen mothers to participate in the study and informed them about the purpose of the study and the confidentiality of any information given to the researcher.
- The studied mothers were interviewed in waiting area of the rural health units. The data was collected by administering the questionnaire sheet to each mother individually to complete it by herself with the attendance of the researcher to offer guidance and clarification when needed. The illiterate mothers asked the questionnaire orally and the researchers fill the sheet according to their answers.
- The total believes and practice scores of the studied mothers regarding antibiotics use was classified into two categories as follows:
  * Good: ≥70% of the total score.
  * Bad: < 70 % of the total score
- The total knowledge scores of the studied mothers regarding antibiotics use was classified into two categories as follows:
  * Good: ≥70% of the total score.
  * Poor: < 70 % of the total score

4- Statistical analysis

The data were coded, entered and analyzed using SPSS (version 20). Descriptive statistics (frequency numbers and percentages) identified demographic characteristics and mothers responses to the questionnaire. Paired t / f tests were used to analyze the relationships; statistical significant was set at P value <0.05%. Linear coefficient correlation was used to examine the correlations between Knowledge, believes and practices total scores.

RESULTS

Table (1) shows distribution of the studied mothers according to their Socio-demographic characteristics .The table illustrated that, the age of the majority (84.5%) of the studied mothers ranged from 20 to 40 years, and slightly less than half (48.6%) of them were secondary educated. The table also reveals that, slightly less than two thirds (64.4%) of them were house wives. In addition, slightly more than two fifths of the studied mothers had 3-5 children, had health insurance, and utilize health care at times of vaccination (43.50, 44.70, and 41.70 respectively). Table (2) shows distribution of the studied mothers according to their knowledge about antibiotics. About two third (69%) of the studied mothers reported that they have their antibiotic information from a doctor and more than one quarter of them (28.4) from mass media. In relation to antibiotic use, nearly one third (32.8%) of mothers reported that antibiotic is used to decrease temperature followed by 29.8% of them reporting the use of antibiotics to relieve pain and fatigue compared to only about one quarter (26.3) of the mothers know that the aim of antibiotic use is to kill microorganisms. The studied mothers also reporting that, the main source of getting antibiotic is a doctor prescription for slightly more than two thirds (69.1%) of them followed by about one quarter (26.1%) from a pharmacist prescription. Less than one half (45%) of the studied mothers know that the suitable duration of antibiotic use is determined according to doctor's prescription. 37.7% of the mothers reported that antibiotics should be taken after breakfast and dinner or at any time when prescribed twice /day. Regarding the misuse of antibiotic, about half (51%) of mothers know all the different forms of antibiotic misuse while the rest percentage (49%) know one or two of these forms. The table also demonstrated that only 41.9% of mothers know the hazard effects of antibiotic use without medical reason. In relation to the meaning of antibiotic resistance, slightly more than one third (37.5%) of mothers know the complete meaning compared to 31.6 and 30.9 who know incomplete meaning and do not know respectively. The table also demonstrated that 44.2% of the mothers reported that antibiotics must be used for fever. In addition, only about one third (33.2%) of mothers know that antibiotics have side effects and less than half (46.3%) of them know the different side effects of antibiotics.

Table 1. Distribution of the studied mothers according to their socio- demographic characteristics

Socio-demographic characteristics of studied mothers		
Items	N=1000	%
age of mother :		
20 - 40	845	84.50
more than 40	155	15.50
level of education:		
illiterate or read and write	161	16.10
elementary education	91	9.10
secondary education	486	48.60
university education	262	26.20
mother's occupation:		
housewife	356	35.60
working	644	64.40
Number of children:		
less than three	520	52.00
3-5	435	43.50
more than 5	45	4.50
family income:		
Enough	675	67.50
Not enough	259	25.90
Enough and save	66	6.60
presence of health insurance:		
yes	447	44.70
no	553	55.30
health care utilization:		
Just a follow-up without disease	63	6.30
In times of vaccination	417	41.70
When I feel sick or a family member	374	37.40
Not used	146	14.60

Table 2. Distribution of the studied mothers according to their knowledge about antibiotics

Mother's knowledge regarding antibiotics	N= 1000	%
Source of antibiotic information*		
Doctor	690	69
Mass media	284	28.4
family and friends	158	15.8
Pamphlets	43	4.3
Aim of antibiotic use*		
decrease temperature	328	32.8
relief pain &fatigue	298	29.8
treat cold and influenza	167	16.7
protect from diseases	185	18.5
kill microorganisms	263	26.3
sources of getting antibiotics*		
from old one in the home	136	13.6
from doctor	691	69.1
from pharmacist	261	26.1
The suitable duration for use		
until ending the bottle	229	22.9
until symptoms relief	331	33.1
according to doctor's prescriptions	453	45.3
Giving twice dose of antibiotic		
every 12 hours	623	62.3
after breakfast and dinner	347	34.7
any time when remember	30	3
Forms of antibiotic misuse include		
not given in the identified time	137	13.7
stop taking early	81	8.1
do not give some of doses	112	11.2
take antibiotic without doctor prescription	186	18.6
all of the above	510	51
Effects of antibiotic use without medical reason		
decrease in its effect within the time	163	16.3
organism becomes more resistant	140	14
cause anemia	185	18.5
all of he above	419	41.9
no thing occurs	102	10.2
what is the meaning of antibiotic resistance		
Incomplete correct answer	316	31.6
Complete correct answer	375	37.5
do not know	309	30.9
antibiotic must be taken for fever		
Yes	442	44.2
No	407	40.7
Do not know	151	15.1
antibiotic decrease infection period		
Yes	762	76.2
No	238	23.8
antibiotics have side effect		
Yes	332	33.2
No	470	47
Don't know	198	19.8
Side effects result from antibiotic*		
Anorexia	45	13.5
gastric disturbance	69	20.7
Diarrhea	35	10.5
Anemia	12	3.6
antibiotic resistance	24	7.2
decrease in an antibiotic effect	19	5.7
all of the above	154	46.3

* More than one answer

Table (3) shows distribution of the studied mothers according to their belief about antibiotics. The table revealed that about three quarters (74.8%) of mothers believed that the use of antibiotics without prescription is dangerous. However, 57.5% of them may change the doctor if not prescribe antibiotic. Also, nearly two thirds of them (62.4% and 61.7%) have wrong believes that antibiotics may relive influenza manifestation and sometimes ask the physician to prescribe antibiotic in case of cold or cough respectively. The table also demonstrated that about one third

Table 3. Distribution of the studied mothers according to their believes about antibiotics

Mothers ' believes about antibiotic	N	%
Antibiotic relive influenza manifestation		
Agree	624	62.4
Disagree	208	20.8
Do not know	168	16.8
The use of antibiotic without prescription is dangerous		
Yes	748	74.8
No	252	25.2
The case becomes worse without antibiotic		
Agree	354	35.4
Disagree	347	34.7
Do not know	299	29.9
Changing the doctor if not prescribe antibiotic		
Yes	575	57.5
No	425	42.5
Asking the physician to prescribe antibiotic in case of cold or cough		
Never	252	25.2
Sometimes	617	61.7
Usually	131	13.1
The use of antibiotic described for another person is good idea		
Yes	379	37.9
No	621	62.1
If you believe that antibiotic is not effective you will		
Stop it and go to the doctor	448	44.8
Stop it and go to another doctor	288	28.8
Use it for the prescribed period	264	26.4

Table 4. Distribution of the studied mothers according to their practices regarding antibiotics

Mothers' practice about antibiotic	N = 1000	%
use antibiotic as prophylaxis		
Yes	295	29.5
No	705	70.5
Using antibiotic when*		
feel sick or any of the family member	238	23.8
As a Prophylaxis to protect from diseases	295	29.5
If the doctor prescribed it	670	67
Keeping the remaining of antibiotics for future use		
Yes	507	50.7
No	493	49.3
Using of antibiotic without prescription		
Yes	556	55.6
No	444	44.4
Reasons using of antibiotic without prescription *		
because she has no time	53	9.5
to avoid the cost of doctor's visit	158	28.4
because she consider the disease is simple	148	26.7
because doctor describe it before for similar symptoms	297	53.4
Recent use of antibiotics		
Yes	821	82.1
No	179	17.9
In case of yes, person who prescribe it.		
Physician	514	62.6
Nurse practitioner	61	7.4
Pharmacist	159	19.3
One of your friends or relatives	87	10.5
The way of taking antibiotic at the last time		
taking it completely, as described by the doctor	429	42.9
Taken until the end of the package or tape	212	21.2
stopped at the disappearance of symptoms	308	30.8
Taking it and stopped when tired	51	5.1

*More than one answer

(35.4% and 37.9%) of the studied mothers believed that the case becomes worse without antibiotics and that the use of

antibiotic prescribed for another person is a good idea respectively.In addition, only about one quarter (26.4%) of mothers believed that antibiotics should be used for the prescribed period even if it seems not effective.

Table (4) shows distribution of the studied mothers according to their practice regarding antibiotic. The table demonstrated that, more than one quarter (29.5%) of mothers reporting that they used antibiotics as a prophylaxis from diseases and almost half (50.7%) of the studied mothers kept the residual antibiotic from previous prescription for future use if needed. Slightly less than one quarter (23.8%) of the studied mothers use antibiotics if any of the family members get ill. However, the study revealed also that more than half (55.6%) of the mothers use antibiotic for themselves or their family without prescription. This because they had no time (9.5%), to avoid the cost of doctor's visit (28.4%), because they consider the disease is simple (26.7%), or because doctor describe it before for similar symptoms (53.4%). The table also revealed that the majority of the studied mothers reporting recent use of antibiotics (82.1%), and less than two thirds (62.6%) of those mothers reported that they prescribed by the physician. During the last time of antibiotic use, less than half (42.9%) of the studied mothers reported that they complete the course as prescribed by the doctor compared to 21.2% use it until the end of the package and 30.8% use it until symptoms disappears.

Table (5) shows relationship between the mean score of knowledge, believe and practice of the studied mothers and their socio-demographic characteristics. The table demonstrated that there was no significant statistical relationship found between mothers' age and their mean scores of knowledge, believes and practice about antibiotics. In relation to the level of education, the table revealed that the university educated mothers have the higher score of knowledge, believes and practice (7.034±536, 3.321±1.848, and 4.103±1.811 respectively). There was a significant statistical relationship between mothers' level of education and their mean score of knowledge, believes, and practice (P= 0.0001, P=0.017, and P= 0.001 respectably). The table also revealed that, there was a significant statistical relationship between mothers' knowledge and their number of children, family income, health care utilization and occupation (P=≤0.001). In addition, it is observed that there was a significant relationship between mothers' believes and their family income, and health care utilization. Also, there was a significant statistical relationship between mothers' occupation and their practice (P=0.001). However, the housewives mothers had higher score (4.045±1.856) of practice than the working mothers (3.655±1.791).

Figure (1) shows distribution of the studied mothers according to the total score of their knowledge, believe and practice about antibiotic. The figure demonstrated that the majority of mothers (82.4%, and 94.4%) had poor knowledge and believes

Table 5. Relationship between the mean score of knowledge, believe and practice of the studied mothers and their socio-demographic characteristics

Socio-demographic characteristics	N= 1000	%	knowledge score Mean±SD	t-/f- test P-value	believe score Mean±SD	t- test P-value	practice score Mean±SD	t- test P-value
age of mother								
≤40 years	845	84.5	5.854±2.563	t=0.390 P=0.677	3.113±1.878	t=1.494 P=0.225	3.797±1.842	t=1.585 P=0.206
>40 years	155	15.5	5.8±2.383		2.89±1.642		3.755±1.711	
level of education								
illiterate or read and write	161	16.1	4.634±2.132	t=41.198 P=<0.001*	3.143±1.774	t=3.395 P=0.017*	3.292±1.734	t=11.856 P=<0.001*
elementary education	91	9.1	4.791±2.278		2.659±1.701		3.121±1.718	
secondary education	486	48.6	5.809±2.419		3.008±1.878		3.92±1.819	
university education	262	26.2	7.034±2.536		3.321±1.848		4.103±1.811	
No. of children								
less than three	520	52.0	6.038±2.507	F=5.037 P=0.007*	3.098±1.78	t=0.832 P=0.435	3.852±1.839	t=0.546 P=0.579
3 -5	435	43.5	5.715±2.589		3.094±1.923		3.731±1.855	
more than 5	45	4.5	4.933±2.038		2.733±1.814		3.733±1.25	
family income								
Enough	675	67.5	5.941±2.522	t=6.568 P=0.001*	3.206±1.872	t=11.790 P=<0.001*	3.935±1.838	t=6.262 P=0.002
Not enough	259	25.9	5.429±2.541		2.629±1.717		3.506±1.773	
Enough and save	66	6.6	6.545±2.432		3.561±1.746		3.485±1.721	
health care utilization								
Just a follow-up without disease	63	6.3	5.667±2.621	t=14.738 P=<0.001*	2.286±1.385	t=9.306 P=<0.001*	3.206±1.815	t=2.510 P=0.057
In times of vaccination	417	41.7	6.252±2.594		3.345±1.907		3.787±1.861	
When I feel sick or a family member	374	37.4	5.888±2.498		3.075±1.804		3.877±1.807	
Not used	146	14.6	4.671±2.024		2.678±1.785		3.856±1.73	
mother's occupation								
housewife	356	35.6	6.688±2.533	t=8.037	3±1.937	t=-1.020	4.045±1.856	t=3.251
Working	644	64.4	5.384±2.415	P=<0.001*	3.124±1.792	P=0.308	3.655±1.791	P=0.001*

about antibiotics respectively. It is also observed that nearly two thirds of mothers had poor practice regarding antibiotics.

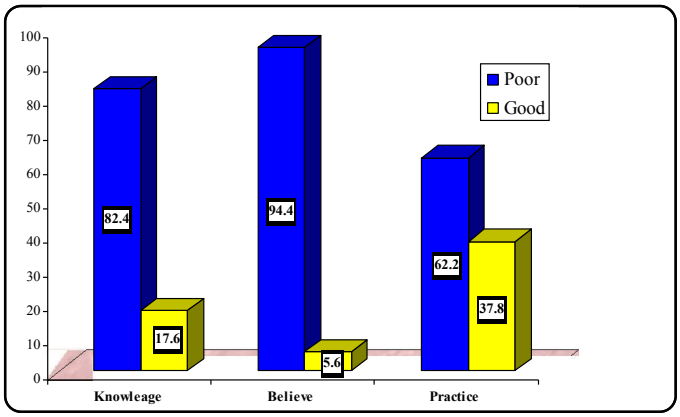
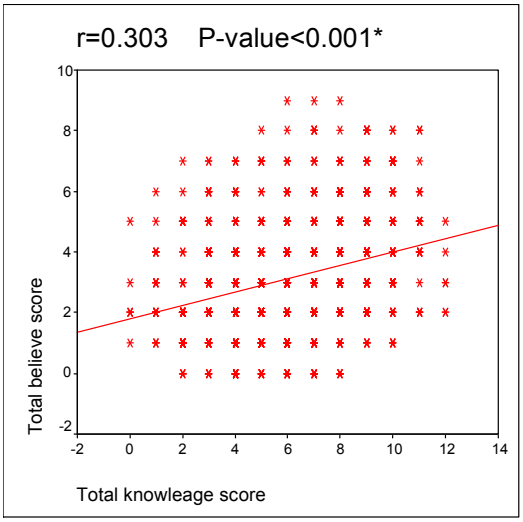
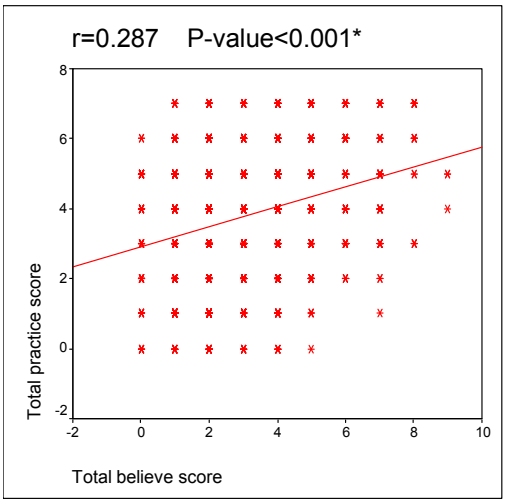


Figure 1. Distribution of the studied mothers according to the total scores of their knowledge, believe and practice about antibiotic

Figure (2) shows the correlation between the studied mothers' total knowledge, believe and practice scores about antibiotic. The figure revealed that there was a significant statistical positive correlation between mothers' total score of knowledge believe and practice and between each other.





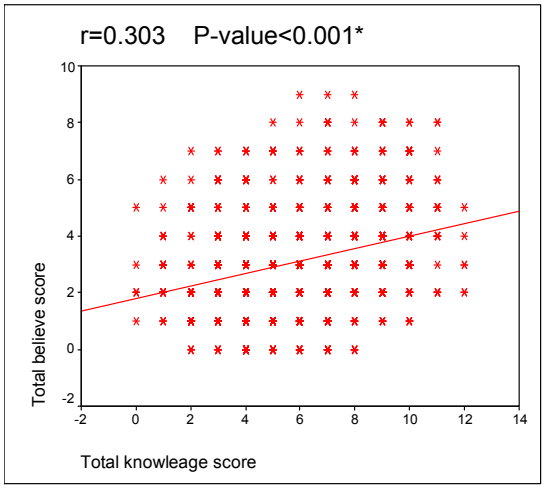


Figure 2. The correlation between the studied mothers' total knowledge, believe and practice scores about antibiotic

DISCUSSION

Knowledge regarding antibiotic therapy issues among the general public has only been studied to a limited extent (You *et al.,* 2008; McNulty *et al.,* 2007; Wutzeke *et al.,* 2007). This cross sectional study determined knowledge, beliefs and practice of rural mothers about the antibiotics in El-Gharbia Governorate, Egypt. Overall results of this study show that most participants had poor knowledge and bad believes regarding antibiotic use which contribute to bad practice and misuse of antibiotics. Less than half of them were aware with the risks of antibiotic use; for example, regarding antimicrobial resistance and possible side effects. Most of them did not know that the main objective of antibiotics use is to kill microorganisms and only half of them knew the different forms of antibiotic misuse. These results are contradicting with results of Aris Widayati *et al.* (2012) who found that the most participants in Yogyakarta City, Indonesia had moderate to adequate knowledge regarding antibiotic use and they were aware with antimicrobial resistance and possible side effects and most of them knew that antibiotics are effective for bacterial infections. This can be related to that the urban people are mostly literate, are able to easily get access to the mass media, and possibly have received more information about antibiotics than those in rural areas. This was also can be supported by what we found that high education and higher income and health care utilization was significantly associated with higher knowledge scores and practice scores. Similar associations found among caregivers of children having ARI in Trinidad and Tobago (Neeta Parimi *et al.,* 2004).

In contrast to what was reported by the Indonesian study (Aris Widayati *et al.,* 2012). Mothers in this study were not familiar with the term "resistance". Only one third of them knew the meaning of antibiotic resistance. These results are similar to that of what was reported by the European study (Grigoryan *et al.,* 2007) and Jordanian study (Mayada Shehadeh *et al.,* 2011). However, it should be noted that when lay people talk about "resistance", this term could mean that human resists to antibiotics rather than microorganisms to antibiotics. Another possibility is that they might perceive the term of resistance as

"something dangerous". Also, information on resistance is not usually provided when purchasing antibiotics (Puspitasari HP, *et al.,* 2011). Kuzujanakis *et al*. associated adequate antibiotic knowledge with having >1 child (Kuzujanakis *et al.,* 2003). In this study there is a significant association between number of children and knowledge score; however those having 1-3 children having the higher score. This goes with the results of Sotiria *et al.* (2012). It was suggested that parents gain experience concerning antibiotic use when dealing with more than one child. However, it is difficult to explain why parents with more than 3 children presented less antibiotic knowledge scores. One could postulate, that families with >3 children tends to be of low socioeconomic status although no such evidence has been reported elsewhere.

A significant proportion of mothers in the present study had misconceptions that could contribute to the inappropriate use of antibiotics. About two third of the mothers believed that antibiotics can relief influenza, cold and cough and more than half of them can change doctor if not prescribe antibiotic; Even though these upper respiratory tract infections are generally of viral etiology (Earnshaw *et al.,* 2009). There is inconsistency in the literature regarding the appropriate knowledge among the community members about the effectiveness of antibiotics in treating viral infections (Andre *et al.,* 2010; Togoobaatar *et al.,* 2010; Panagakou *et al.,* 2011) These facts give evidence to confirm that people are not able to differentiate the types of causal agents of infectious disease, (e.g.: bacteria, viruses, fungal) and they have very limited knowledge and misconception regarding the basic mechanism of how the antibiotics work. These mistaken beliefs may have steered antibiotic abuse from self treatment or over the counter demands at the pharmacy which are fostered from easy availability of these drugs at community pharmacies in Egypt. The percentage of encounters with antibiotic prescription were higher in Egypt than that of Yemen, Sudan, Malawi, Bangladesh and other developing countries (Hogereil *et al.,* 1993). Demanding a prescription for antibiotics from a physician was obvious among mothers in El-Gharbia governorate either usually or sometimes. Such prescribing behaviors may be related to patient's attitude toward management. In Trinidad, Mohan *et al.* (2004) reported that general practitioners attributed antibiotic over-prescribing in general practice to parents' demands (Mohan *et al.,* 2004) Also, in a survey from the United States, 48% of pediatricians reported that parents do pressure them to prescribe antibiotics (Bauchner *et al.,* 1999). Neeta *et al.* (2004) reported that the rate of self-treatment with antibiotics by caregivers was high in Trinidad and Tobago. He suggested that the cost and time spent for a visit to the health center or a physician's office could have pushed caregivers in Trinidad and Tobago to purchase antibiotics without a prescription (Neeta Parimi *et al.,* 2004). In this study more than half of the mothers in El-Gharbia Governorate reported that they taking or giving antibiotic to their children by themselves. Some of them regain this also to the cost of the doctor's visit and having no time. Other mothers regain this behavior to that the doctor prescribes it before for similar symptoms. Braun and Fowles found a correlation between the expectation to get antibiotic treatment and parents' occupation; parents who worked full time had higher expectations to get antibiotic treatment, assuming perhaps that antibiotics can allow an earlier return to work (Braun and Fowles 2000). This can be supported by the result of this study that more than three quarters of the mothers report that antibiotics shorten disease duration. Patients and caregivers education regarding the use and abuse of antibiotics should be considered as antibiotics can be easily prescribed or purchased without prescription in Egypt. In this present study, there was a positive correlation between knowledge, beliefs and practice scores which mean that the more appropriate knowledge and good beliefs people have, the better antibiotic use they do. These results go in the same line with other similar studies (Andreas Rouusounides *et al.,* 2011; Aris Widayati *et al.,* 2012). So when we want to improve practices regarding antibiotics use, we should improve knowledge and beliefs about them firstly. Appropriate knowledge and beliefs regarding antibiotic use may lead people becoming more aware of the disadvantages of using antibiotics inappropriately.

Conclusions and Recommendation

This study revealed that the rural mothers suffer inappropriate use of antibiotics related to lack of knowledge and bad believes, this needs to be guided through different strategies. An easy access to an affordable health care service with a considerable quality is the first step side to side with establishing a national antibiotic policy to be followed by all healthcare workers. The second is to adopt educational programs for rural mothers to raise their awareness about the hazards of antibiotic abuse including bacterial resistance. Additionally, regulations to restrict the unlimited access to antimicrobial drugs with penalties to the offenders should be implemented. Finally, collaboration between authorities, health care providers and service users is crucial to overcome this problem

REFERENCES

Abdel Gawad Elmasry *et al*. 2013. Pattern of antibiotic abuse – a population based study in Cairo, Chest Department, Ain Shams University, Faculty of Medicine, Cairo, Egypt. *Egyptian Journal of Chest Diseases and Tuberculosis*, 62, 189–195.

Admin H. 2013.Parental knowledge, attitudes and practices regarding antibiotic use. HCDCP, E-bulletin, http://www.keelpno.gr/en-us/home.aspx

Allender JA, *et al*. 2010. community Health Nursing: promoting and protecting the public's health. New York: Lippincott Williams, 57-65.

Andre M, *et al*. 2010. A survey of public knowledge and awareness related to antibiotic use and resistance in Sweden. *J Antimicrob Chemothe,r* 65(6):1292-1296.

Andreas Rouusounides, *et al*. 2011. Descriptive Study on Parents' Knowledge, Attitudes and Practices on Antibiotic Use and Misuse in Children with Upper Respiratory Tract Infections in Cyprus. *Nt, J. Environ. Res. Public Health*, 8, 3246-3262.

Arch G. Mainous, *et al*. March–April 2008. Factors Affecting Latino Adults' Use of Antibiotics for Self-Medication. JABFM, Vol. 21 No. 2. http://www.jabfm.org

Aris Widayati, *et al*. 2012. Knowledge and beliefs about antibiotics among people in Yogyakarta City Indonesia: a cross sectional population-based survey. Antimicrobial Resistance and Infection Control, 1:38 doi:10.1186/2047-2994-1-38.

Ausra Berzanskyte, *et al*. 2006. Self medication with antibiotic in Lithuania. *International Journal of Occupational Medicine and Environmental Health*, 19(4):246 – 53.

Azza M, *et al*. 2011. Surveillance of antibiotic use and resistance in orthopedic department in an Egyptian university hospital. *Int J Infect Control*, v7:i1 doi, www.ijic.info.

Azza M. *et al*. 2009. Antibiotic Use and Resistance in Single Orthopedic Department, Egypt. *Egyptian Journal of Medical Microbiology*, October Vol. 18, No. 4

Battle CU. 2009. Essentials of Public Health Biology. Toronto: Jones and Bartlett publishers, 798- 799.

Bauchner H, et.al. 1999. Parents, physicians, and antibiotic use. Pediatrics, 103:395-401.

Braun BL and Fowles JB. 2000. Characteristics and experiences of parents and adults who want antibiotics for cold symptoms. *Arch Fam Med*, 9:589-595.

Cagri Buke, *et al*. 2005. Irrational use of antibiotics among university students *Journal of Infection*, 51, 135–139. www.elsevierhealth.com/journals/jinf

Cavrell MD. Antibiotic knowledge in older adolescents. 2009. A thesis submitted to Southern Connecticut State University, Newhaven in partial fulfillment of the requirement for the master degree of public health.

Ce´spedes and Larson. 2006. Knowledge, attitudes, and practices regarding antibiotic use among Latinos in the United States: *Review and Recommendations*. AJIC, Vol. 34 No. 8.

Earnshaw,S, *et al*. 2009. Eurpean antibiotic awareness day technical advisory committee; European awareness day collaborative group, 2008- the first Europe-wide public information campaign on prudent antibiotic use: methods and survey of activities in participating countries. Euro. Surveill, 14, 19280:1-19280:8.

Elberry *et al*. June 2012. Evaluation of non-prescribed antibiotic use among children with upper respiratory tract infection, *International Research Journal of Pharmacy and Pharmacology*, (ISSN 2251-0176) Vol. 2(6) pp. 147-152,

Ganchimeg Togoobaatar *et al*. 2010. Non-prescribed use of antibiotics for children in an urban community in Mongolia. *Bull World Health Organ*, 88: 930 – 936.

Grigoryan L, *et al*. 2007. Attitudes, beliefs and knowledge concerning antibiotic use and self-medication: a comparative European study. *Pharmacoepidemiol Drug Saf*, 16(11):1234-1243.

Hala Abdullah Hussien Abu Romman. June 2013. Patterns of antibiotic use among children *Int. J. Med. Med. Sci*, Vol. 5(6), pp. 264-272.

Hanan S Ez-Elarab, *et al*. July 2009. Appropriateness of antibiotic use at two university hospitals in Egypt. *The Egyptian Journal of Community Medicine*, Vol. 27 No. 3.

Hogereil HV, *et al*. 1993. Field tests for rational drug use in twelve developing countries. Lancet, 342: 08-1410.

Kuzujanakis JM, *et al*. 2003. "Correlates of parental antibiotic knowledge, demand, and reported use," Ambulatory Pediatrics, 3(4): 203–210.

Mayada Shehadeh, *et al*. 2011. Knowledge, attitudes and behaviors regarding antibiotics use and misuse among adults in the community of Jordan. Saudi pharmaceutical Journal, xxx,xxx-xxx.

McNulty CA, *et al*. 2007. Don't wear me out- Publics' knowledge of and attitudes to antibiotic use. *J Antimicrob chemother* 59: 727-38.

Mohan S, *et al*. 2004. Physician behaviour for antimicrobial prescribing for paediatric upper respiratory tract infections: a survey in general practice in Trinidad, West Indies. *Annals of Clinical Microbiology and Antimicrobials*, 3:11.

Neeta Parimi, *et al*. 2004. Caregivers' practices, knowledge and beliefs of antibiotics in paediatric upper respiratorytract infections in Trinidad and Tobago: a cross-sectional study. C Family Practice, 5:28 doi:10.1186/ 1471-2296-5-28

Osama H, *et al*. 2012. Antibiotic misuse in different hospital words (A pilot study in an Egyptian hospitals). *Asian J Pharm Clin Res*, 5 (2): 95-97.

Osama H, *et al*. 2012. Evaluation of Drug and Antibiotic Utilization in an Egyptian University Hospital: An Interventional Study. Intern Med, 2: 2. http://dx.doi.org/10.4172/2165-8048.

Panagakou SG, *et al*. 2011. Antibiotic use for upper respiratory tract infections in children: a cross-sectional survey of knowledge, attitudes, and practices (KAP) of parents in Greece. *BMC Pediatr*, 11:60.

Puspitasari HP, *et al*. 2011. Do Indonesian community pharmacy workers respond to antibiotics requests appropriately? *Trop Med Int Health*, 16(7):840-846.

Ricci SS. 2007. Essentials of maternity and women's health nursing. Lippincott: Williams Wilkins, 4-6.

Shehadeh M. *et al*. 2012. Knowledge, attitudes and behavior regarding antibiotics use and misuse among adults in the community of Jordan: "A pilot study". *Saudi Pharmaceutical Journal*, 20, 125–133, www.sciencedirect. com.

Sotiria G. *et al*. 2012. Risk Factors of Antibiotic Misuse for Upper Respiratory Tract Infections in Children: Results from a Cross-Sectional Knowledge-Attitude-Practice Study in Greece. ISRN Pediatrics, Article ID 685302, 8 pages , doi:10.5402/2012/685302 Research Article

Storr J, *et al*. 2012. Cutting levels of antimicrobial resistance. Nursing Times, 108: 46, 22-23.

Togoobaatar G, *et al*. 2010. Survey of non-prescribed use of antibiotics for children in an urban community in Mongolia. *Bull World Health Organ*, 88(12):930-936.

WHO 2001: Global strategy for containment of antimicrobial resistance. Switzerland: World Health Organization.

Wutzeke SE, *et al*. 2007. Evaluation of the national program to reduce inappropriate use of antibiotic in upper respiratory infection: effect on consumer awareness, beliefs, attitudes and behaviors in Australia. *Health Promote Int*, 52: 53-64.

You JH, *et al*. 2008 Mar. Public knowledge, attitudes and behaviors on antibiotic use, Telephone survey in Hong Kong. Infection; 36: 135-7.

****