SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medicine

Antibiotics Misuse in Children KAP Survey of Parents at Benghazi-Libya 2021

Haneya Mailod Kamel Ali[1*], Najat B. Elgazal[1]

[1]Faculty of Medicine, University of Benghazi, Libya

DOI: 10.36347/sasjm.2022.v08i11.010 | **Received:** 11.10.2022 | **Accepted:** 21.11.2022 | **Published:** 26.11.2022

***Corresponding author:** Haneya Mailod Kamel Ali
Faculty of Medicine, University of Benghazi, Libya

Abstract **Original Research Article**

Introduction: Children are known to receive antibiotics more often than anyother type of drug, as they are frequent subjects of infections of various etiologies. The improper use of antibiotics is the most important cause of the modern expansion of antibiotic resistance. The development of antibiotic resistance, with its clinical and economic consequences. Increased bacterial resistance is threatening the therapeutic effectiveness of antibiotics. High level of antibiotic use is probably the main factor driving the emergence of resistant. ***Objectives of the Study:*** To determine the level of awareness of antibiotic use in Benghazi 2021 among parents of children and to identify factors associated with parent's decision regarding use of antibiotics. ***Materials and Methods:*** A convenient sample of 2000 questionnaires was distributed among parents of their children aged from 6moths to 6 years. By direct an interview to the parents at Benghazi city during the period from September to December –2021 who agreed for an interview survey. The questionnaire was developed by the researcher, and the data collected by well- trained interviewer team (the researcher and his colleagues, including doctors, medical students and pharmacists). The questionnaire contains were focused on the knowledge and attitude and practice of parents including the general knowledge on antibiotics, side effects of antibiotics use, the ideal mechanism of action of antibiotics and if antibiotics can cause allergy. If the parents use antibiotics to their children without a doctor's prescription, the reasons for use antibiotics without doctor's prescription. A score technique was chosen as suitable method to identify the level of awareness among parents regarding antibiotics use. A Scoring for questions knowledge five questions, every question gives 2 marks. ***We Categorize Score as:*** Deficient (poor), intermediate (average), Optimum (good) marks. The participants responded to the questionnaire without any outside interference, where a score was given to each answer. The highest the score represents a higher or better level of awareness regarding misuse of antibiotics among parents. ***Statistical Analysis* was done:** Data are presented as frequencies, percentages, mean ± standard deviation (SD) as appropriate. Data collected and statistically analyzed by the Statistical package social science program (SPSS). ***Results & Conclusion:*** Among 2000 participants included in the survey. Most of parents were mothers and most of the mothers responded very well for the survey. In general, we conclude that the vast majority of parents were use antibiotics without prescription from the doctors when their children sick and had fever and expected pediatricians to prescribe antibiotics for their children and due to the lack of aware of the risks associated with use of excessive antibiotics**.** Furthermore, there were many reasons for purchasing antibiotics without prescription such as long waiting time at clinics then previous experience with similar antibiotics also expenses involved in visiting private and public clinics, and the ease of obtaining antibiotics private pharmacies. An overall, participant's knowledge regarding antibiotics use in pediatrics was (intermediate score) 60 % with negative attitude and poor practices towards antibiotics use in children at Benghazi city. Mistaken beliefs and behaviors among parents, that buying antibiotics from the pharmacy when their children were sick without prescription from the physician. Because it is well known that in Libya there is broad accessibility to antibiotics without prescription in all the pharmacies. Finally our conclusion, we are under high risk of antimicrobial resistant (AMR) spread due to misuse of antibiotics. We categorize score as: Deficient (poor), intermediate (average), Optimum (good) marks. The participants responded to the questionnaire without any outside interference, where a score was given to each answer. The highest the scorerepresents a higher or better level of awareness regarding misuse of antibiotics among parents.

Keywords: parents, Antibiotics, knowledge, Attitude, practice.

INTRODUCTION

Antibiotics were considered one of the greatest inventions of 20th century.

Before this, infectious diseases contributed to high mortality and morbidity throughout the world. But this situation was short lived. Soon antibiotic resistance became an issue of growing concern worldwide. At present, antibiotics are the most commonly sold drugs in the developing countries. The rampant and excessive use of antibiotics for any and every condition has escalated the problem of antibiotic resistance [1].

Since their discovery decades ago, antibiotics brought lifesaving benefits and constitute today a major source of drug-related health expenditures. They were behind the eradication of many serious bacterial infections, particularly in pediatrics. Indeed, children are major consumers of antibiotics, with findings showing a higher intake among children aged 1 to 5 years (65%), in comparison with teenagers (38%). However, antibiotics consumption, whether in adults or children, has not been always rational or appropriate and errors could be encountered in the antibiotic indication, choice, dose or duration, administration or even adherence to therapy [2].

Thus, antibiotics misuse referring to the irrational use or overuse of antibiotics might threaten any patient from all age groups and might concern any antibiotic [3-5].

It is increasingly contributing to antibiotic resistance, and is currently considered a serious public health concern globally, with a particular focus on developing countries [8]. In fact, self-medication with antibiotics, considered a major driver of antibiotics misuse, is highly prevalent in the latter countries where awareness and regulations often lack reinforcement [2, 6].

Antibiotics have played vital roles in the treatment and prevention of various infectious diseases since the discovery of the first antibiotic (penicillin) in the 1940s. However, the misuse of antibiotics has led to side effects that sometimes become life-threatening. Thus, appropriate use of antibiotics is necessary in order to obtain their benefits with minimal side effects. However, in developing countries, there is rampant and persistent use of non-prescribed antibiotics among many individuals. This improper behavior plays a major role in the emergence of antimicrobial resistance [7].

Antimicrobial resistance has resulted in serious adverse effects, particularly in children. Antibiotics alter gastrointestinal microbiota.

A link between the gut micro biota and brain function has shed more light on the pathophysiology of several psychiatric disorders such as depression and Alzheimer‟s disease [7].

The importance of the gut microbiota in the development of the cardiovascular and nervous systems has also been established .Thus, awareness of proper use of antibiotic may help to avoid the development of resistant strains of bacteria, while eradicating diseases among the young [7].

Children with Upper Respiratory Tract Infections (URTIs), which are predominantly self-limiting, constitute a significant proportion of primary care physician‟s visits. Antibiotics (AB) are too often prescribed for children with URTIs symptoms despite the fact that they are mostly of viral origin, and there is no evidence that antibiotics would improve their outcome. This prescription behavior contributes to the development of antibiotic resistance, with its clinical and economic consequences.

Futhermor, the upper respiratory tract infections (URTIs) in children are mainly due to viral infections. Thus, the benefit from antimicrobial drugs is minimal. However, there is strong evidence that antibiotics are frequently administered to children suffering from URTIs. It appears that both pediatricians and parents are responsible for this antibiotic misuse which is contributing to the development of resistant strains of bacterial pathogens and placing a burden on the economy of the health care system [9].

Rapidly emerging resistant bacteria threaten the extraordinary health benefits that have been achieved with antibiotics. This crisis is global, reflecting the worldwide overuse of these drugs and the lack of development of new antibiotic agents by pharmaceutical companies to address the challenge [7, 9].

Antibiotic-resistant infections place a substantial health and economic burden on the U.S. health care system and population [10].

Therefore, this study is relevant as it highlights an alarming overuse of antibiotics without prescription by parents of children below the age of 6 years.

The likely factors associated with parental decisions regarding antibiotic use without prescription were also measured. The data from this study may help prioritise, target, implement, and evaluate interventions that improve antibiotic dispensing practices for febrile children in Benghazi- Libya [8].

OBJECTIVES OF THE STUDY

- To determine the level of awareness of antibiotic use in Benghazi 2021 among parents of children.
- To identify factors associated with parent's decision regarding use of antibiotics.

MATERIALS AND METHODS

Study Design

A descriptive cross sectional study was conducted in Benghazi city, using questionnaire KAP (knowledge, Attitude and Practices) towards misuse of antibiotics among parents.

Study Sample and Study Period

A convenient sample of 2000 questionnaires was distributed among parents of their children aged from 6moths to 6 years. The questionnaire designed by the author. By direct an interview to the parents at Benghazi city during the period from September to December –2021 who agreed for an interview survey. The questionnaire was developed by the researcher, and the data collected by well-trained interviewer team (the researcher and his colleagues, including doctors, medical students and pharmacists). Only excluded the parents if UN co- operative for interview questionnaire. The questionnaires were distributed to visitors at Benghazi Children Hospital as major point health care of children in Benghazi city and in some private clinic and pharmacies in Benghazi city.

The questionnaires distributed as the following: (1480) Benghazi Children Hospital, (40) NewAL- Marwa Hospital, (100) Vanessa Hospital, (100) Alraheq pharmacy, (200) Qairawan pharmacy and (80) Arrebat pharmacy the total of 2000 questionnaires were collected.

The Study Variables

The survey contains questionnaires were divided into two sections and designed to determine the level of parental awareness, understanding, and practice of pediatric antibiotic misuse.

The first section of the questionnaire was designed to collect participants‟ general information, including socio- demographic data such as age, gender, residence number of children, and level of qualification (level of education).

The second section of the questionnaire focused on the knowledge and attitude and practice of parents including the general knowledge on antibiotics, side effects of antibiotics use, the ideal use mechanism of action of antibiotics and if antibiotics can cause allergy.

If the parents use antibiotics to their children without a doctor's prescription, the reasons for use antibiotics without doctor's prescription.

A score technique was chosen as suitable method to identify the level of awareness among parents regarding antibiotics use.

A Scoring for questions knowledge five questions, every question gives 2 marks. We categorize score as: Deficient (poor), intermediate (average), Optimum (good) marks. Scoring for questions about awareness towards:

1 - 4 marks	deficient (Poor) < 50 %.
5 - 7 marks	intermediate (Average) 50-80 %.
8 -10 marks	optimum (Good) >80 %.

The participants responded to the questionnaire without any outside interference, where a score was given to each correct answer. The highest the score represents a higher or better level of awareness regarding misuse of antibiotics among parents.

Ethical Consideration

An ethical consideration was taken by a verbal consent for agreement from parents to participate in the study.

Statistical Analysis

Data are presented as frequencies, percentages. Data collected and statistically analyzed by the Statistical package social science program (SPSS) version 20.

RESULTS

A total of 2000 parents at Benghazi city all are Libyans and all from Benghazi city. The responses from parents were very good.

Table 1: Demographic characteristics of parents for the children (respondents), Benghazi city 2021 (N= 2000)

Demographic characteristics	Parents		
	Variables	No.	Percent
Nationality	Libyan	2000	100%
	Non-Libyan	0	0%
Residency	From Benghazi	2000	100%
	Benghazi from rural area	0	0%

All the parents were Libyan and from Benghzi city (N= 2000).

Table 2: Distribution of parents / guardians (mothers or fathers or others of the children) according to age group

Age group	No.	%
16 - 25 years	239	12 %
26 - 35 years	976	48.8 %
36 - 46 years	772	38.6 %
47 years or more	13	0.7 %
Total	**2000**	**100 %**

The majority of parents/guardians age range between 26-35 years.

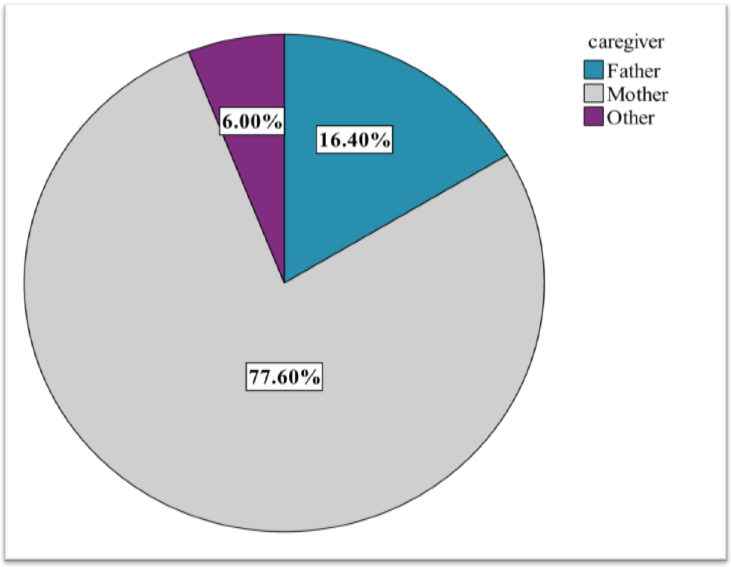

Figure 1: Distribution of caregivers /study population (Mothers, Fathers or Others)

The above figure demonstrates the most common parents/guardians to the children were mothers.

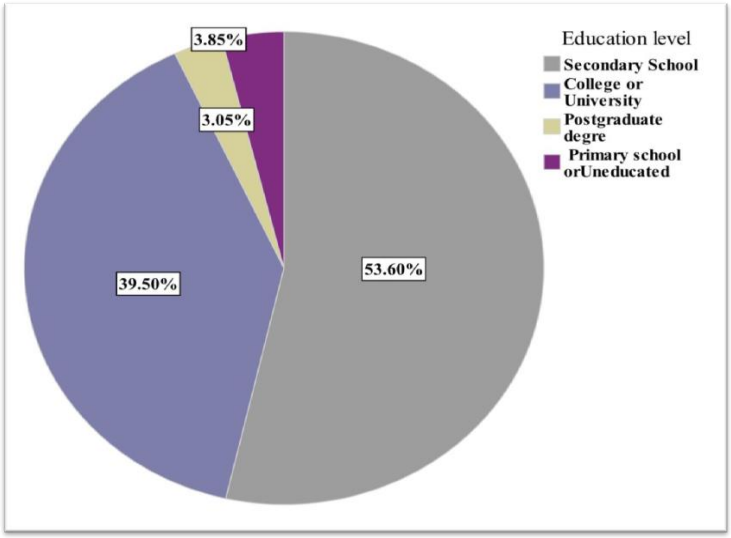

Figure 2: Distribution of parents / guardians according to Level of education

The above figure shows the vast majority of parents / guardians of their level of education were secondary school.

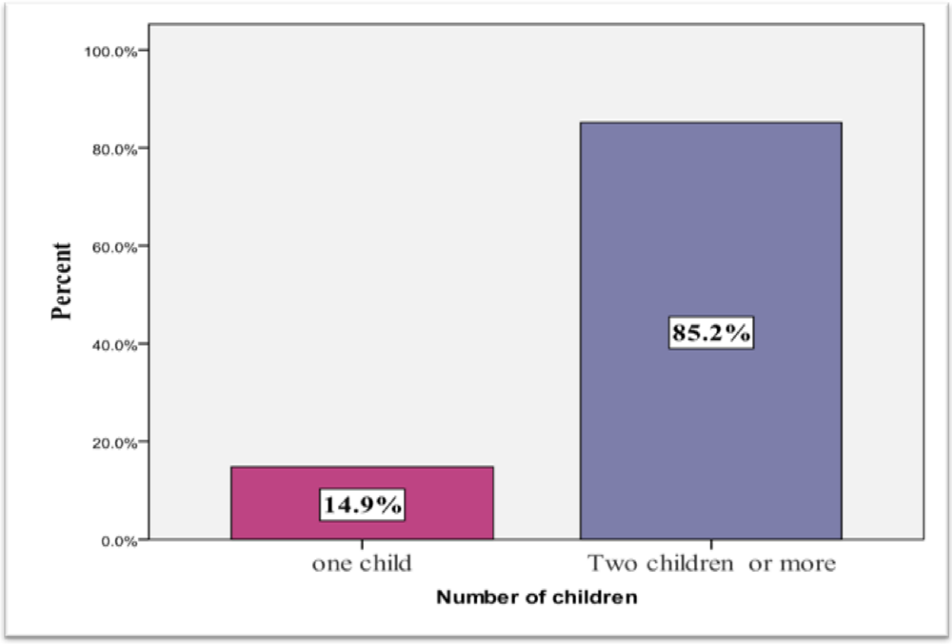

Figure 3: Distribution of parent's according to number of children

Table 3: Participant's Knowledge regarding use of antibiotics (N= 2000)

Participant's knowledge	Answer Yes	%	I do not Know	%
The parents had general knowledge about antibiotics	843	42.1%	11	14.4%
The parents had knowledge regarding the side effects of antibiotics	254	12.7%	1746	87. 3 %
The parents had knowledge about of antibiotics can cause allergy	758	37.9%	1242	62.1%
Knowledge about antimicrobial resistance	254	12.7%	1746	87. 3 %
The parents had knowledge about misuse of antibiotics that can produce secondary bacterial infection	254	12.7%	1746	87.3%
Knowledge about mechanism of action of antibiotics	250	12.5 %	1750	87. 5%
The parents had Knowledge to differentiate between antibiotics and other drugs	2000	100%	0	0%

Table 4: Participant's awareness score regarding use of antibiotics

Participant's Knowledge	Score
The first, second & third questions Knowledge about side effect of AB? Knowledge about antimicrobial resistant? (AMR). Misuse of antibiotics that can produce secondary bacterial infection?	Poor (Deficient)
The fourth question Antibiotics can cause allergy?	Average (Intermediate)
The fifth question Can differentiate between antibiotics and other drugs?	Good (Optimum)

We choose answers to the 5 questions /statements related to the knowledge regarding every question had two marks.

The first & second questions on side effects of antibiotics 87.3% of participants did not aware of side effect ABs and antibiotic resistance. Specifically, most of the parents disagreed with the fact that antibiotics can kill good bacteria present in the organism. Regarding the second question (antibiotic resistance), 12.7% of the parents did not agree with the statement "Antibiotic resistance is a phenomenon that takes place when a bacterium loses its sensitivity to an antibiotic."

The third question, only 12.7% of the parents they said antibiotics that can produce secondary bacterial infection. No knowledge about antibiotics that can kill normal flora. So, Poor score in three questions about the knowledge.

An overall Participant's Knowledge regarding antibiotics was intermediate (average score nearly 60%).

Table 5: Reasons for purchasing antibiotics without a prescription from the doctors (N= 2000)

Reasons N=2000	Yes	%	No	%
If the child sick and had symptoms & signs such as fever, runny nose and cough or others	1826	91.3 %	174	8.7 %
Ease of obtaining the antibiotics in the private pharmacies	2000	100 %	0	0 %
Expense involved in visiting the clinics	1114	55.7 %	886	44.3 %
Long waiting time at the private and public clinics	2000	100 %	0	0 %
The parents had a previous experience with similar antibiotics	778	39.9 %	1222	61.1 %

Table 6: Distribution according to signs and symptoms of the sick children who gave antibiotics without prescription (N= 2000)

Reason	No.	%
The child had URTI with fever	782	39.1 %
The child had runny nose &cough (common cold)	192	9.6 %
The child had wound infections	197	9.9 %
The child had diarrhea & vomiting & abdominal pain (gastrointestinal symptoms)	693	34.7 %
The child had urinary symptoms such as dysuria (urinary tract infection)	136	6.8 %

In particular, 39.1% of the sample declared that antibiotics are useful for URTI with fever, and 34 .7 % that antibiotics are useful for diarrhea & vomiting & abdominal pain.

Table 7: The attitude among parents/ caregivers for discontinuation use of antibiotics (N= 2000)

Attitude/ Behavior	Caregivers		
		Number	Percent %
Discontinuation time	At no symptoms	852	46.6
	After finish the bottle of antibiotics without full course	496	24.8
	After finish full course	652	32.6

46.6% declared that it is admissible to stop taking antibiotics when symptoms decrease.

Negative Perception

Table 8: Distribution according to the perception (opinion) of parents that the doctors only should prescribe the antibiotics for their children if need

Perception		Number	Percent	Total	
Do you think the doctors are only prescribe the use of antibiotics for their children	Important	1026	51.3%	**2000**	**100%**
	Not important	974	48.7%		

Nearly less than half of participant's attitude score regarding use of antibiotics was negative.

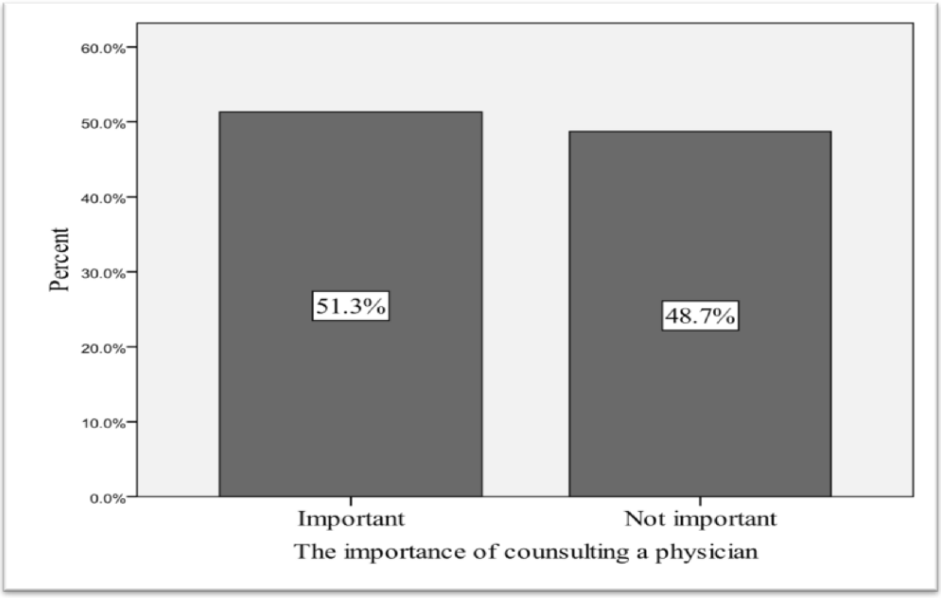

Figure 4: Distribution of caregiver's according to believe regarding use of antibiotics is the decision taken by the doctors only

Table 9: Current practices among parents regarding antibiotics use (N= 2000)

Caregivers Practice		Number	Percent
Buying antibiotics without prescription of doctors each time the child sick	Yes (Poor practice)	1826	91 %
	No (good practice)	174	8.7 %
Keeping the remaining doses for future use	Yes (Poor practice)	1583	79.2 %
	No (good practice)	417	20.9 %

Most of caregivers (91%) were buying antibiotics without doctor's prescription. Purchasing AB without prescription and discontinuation of AB without finishing the course keeping the remaining doses for future use.

In general, Participant's practices score regarding use of antibiotics (Poor practices).

DISCUSSION

The results of our study recorded that the most common caregivers of the children were mothers (77.6%) while fathers represent 16.4% and others only 6% and most of the mothers among parents. Responded very well for the survey more than half of the parents nearly 54% their level of education were secondary schools and college and post graduate in 42.5 %of the parents.

Nearly half of parents their age group was between 26- 35years and nearly 39 % between 26–35 years. They had good knowledge about the antibiotics this reason could be the high level of education.

Regarding the knowledge about the antibiotic use for the children, less than half of the respondents 42.1% had the basic knowledge regarding the antibiotics.

Lack of knowledge regarding the side effect of antibiotics and lack of awareness about antibiotic resistance in the majority of parents, they did not know the side effects of the antibiotics and the antimicrobial resistant. Williams, whereas, Megan RW and his colleagues in UK (2018) stated that the antibiotic resistance is an important public health concern. The number of infections caused by resistant bacteria is increasing. Overuse and inappropriate prescribing of antibiotics is driving antibiotic resistance [20].

When compared our results with Jordan study were the majority of Jordanian mothers lack the basic knowledge about URTIs and the optimal use of ABs, complicated with negative attitudes towards AB use. Positive attitudes strongly predict good AB practices, and these attitudes have to be corrected in order to reduce AB misuse and overuse, to restraint AB resistance [8].

Moreover, all parents in our study had the good knowledge to differentiate between the antibiotics and the other drugs.

When compared our study with Lebanon study. Parents are still confused about antibiotics spectrum of activity and only 42% knew that they were used for bacterial infection. This finding is in agreement with the result of another survey conducted in India where nearly 46% of parents believed that antibiotics can be used to treat both bacterial and viral infections. This may be attributed to the fact that while counseling, physicians usually use the term “germs” with antibiotics, rather than specifying bacteria. Also, people do not understand the difference between bacteria and viruses and hence, believe that antibiotics are effective against both.

From this survey nearly half of parents had an opinion that the doctors only should prescribe the use of the antibiotics and giving antibiotics to their children acceptable without a medical prescription, and the other half said no need for the doctors to prescribe antibiotics.

In this study eighty percent of the parents believed that the presence of fever requires the administration of an antibiotic and agreed that most of the upper respiratory tract infections viral or bacterial need antibiotics. Moreover, our results also consistent with Lebanon study that reported that a high percentage of parents still believe antibiotics work on viruses and find giving antibiotics to their child acceptable without a medical prescription. Higher educational levels among parents and lower years of experience among pharmacists were associated with a better overall knowledge in Lebanon study [2]. Bangladesh study reported that antibiotic abuse has contributed to the development of antimicrobial resistance (AMR) and has become a global concern. With a poorly regulated health system and a general lack of data, Bangladesh remains under high risk of AMR spread [21].

The results of Bangladesh study showed that more than half of the respondents had poor knowledge and neutral attitude towards antibiotics [21].

Regarding the main reason for purchasing antibiotics without prescription when their children were sick, long waiting time at clinics 100% of parents, then previous experience with similar antibiotics also expenses involved in visiting private and public clinics the price of the clinics was high also lack of knowledge on the importance of consulting a physician in nearly half of the respondents , and the ease of obtaining antibiotics private pharmacies, all these factors responsible for bought the antibiotics without prescription from the doctors.

In this survey mistaken beliefs that buying antibiotics from the pharmacy when their children were sick without prescription from the physician.

Same results of poor knowledge and mistaken beliefs about the use of antibiotics for URTI are a significant problem among Latino parents and legal guardians of pediatric patients [22].

A previous study recommended that the clinicians should encourage parents not to use antibiotics without prescription in their children and warn them about potential side-effects and the emergence of antibiotic resistance [12].

While, a similar study conducted in Indonesia recorded that the high prevalence of antibiotic use was observed in children under 5 years of age with common clinical symptoms such as fever, respiratory symptoms, and diarrhea. The major source to obtain antibiotics was to consult health professionals, and 66% of antibiotics were from private doctors, midwives, or nurses [23].

In this study good practice only in few numbers of parents were discarded the remaining of the antibiotics while the vast majority of parents had bad practice.

There are regional disparities in antibiotic misuse among Chinese children. Children in less developed provinces face higher risks of antibiotic misuse both at home and when attending medical practitioners [24].

Although Hani *et al.,* reported that the self-medication with antibiotics may aid in the treatment of minor ailments, and therefore play an important role in decreasing the financial burden due to costs of medical services, especially in countries with limited healthcare resources. However, the disregard for antibiotics prescription regulations is a major cause of irrational antibiotics use and antibiotic resistance [16]. Our r survey found febrile illness in children is the major cause to use antibiotic without prescription, same results regarding febrile illnesses in children less than five years of age are common cause for use antibiotic with prescription [25].

As fever is also the single most common reason for children to be seen by medical practitioners. Clinical practice guidelines (CPGs), such as the Integrated Management of Childhood Illness (IMCI), aim to standardize the symptomatic management of fever in children. These guidelines Antibiotics promote the rational use of antimicrobials by recommending antibiotics be exclusively prescribed to children who are presumed to have a disease that can be treated using antibiotics, based on World Health Organization (WHO) recommendations [25].

Our finding lack of knowledge on the importance of consulting a physician in nearly half of the respondents, negative attitude and poor practices towards antibiotics use in children in Benghazi – Libya.

Same observation from a previous study for the determinants of misuse of antibiotics among parents of children attending clinics in regional referral hospitals in Tanzania the study recorded that most parents had poor knowledge, negative attitude, and poor practice towards antibiotics use in children. Parents‟ education level, employment status, knowledge on antibiotic use, and good attitude contributed to the appropriate use of antibiotics in children attending clinics at Tanzania [26].

Yingfen Hsia *et al.,* study recorded that the increasing rates of antimicrobial resistance are a threat to global child health. The Sustainable Development Goals for child mortality due to pneumonia and sepsis are currently not predicted to be achieved [27].

Ensuring appropriate access to antibiotics while avoiding excess use, especially of unnecessarily broad-spectrum agents, is a major challenge in all settings, but particularly so in lower-income and middle-income countries. About 90% of all antibiotics are used in the community, and this setting is potentially where the largest effect for antibiotic access and stewardship could be achieved [27].

From a thesis in Sweden, the thesis presents a serious lack of knowledge on appropriate antibiotic use among the healthcare providers (HCP) as well as the caregivers [28].

The thesis reported that acute respiratory infection has consistently been estimated as the leading cause of childhood mortality and morbidity [28].

Also found that that antibiotic is often over-prescribed or -dispensed for common colds. Most children with mild ARIs had used, what appear to be, unnecessary antibiotics. Mild ARIs are extremely common in children and typically characterized by rhinitis, sore throat, cough, and with or without fever [28].

Since mild ARIs are commonly caused by virus, but there are no suitable therapeutic antiviral drugs available and theses illness are often self-limiting within one or two weeks, the treatment should be only symptomatic, e.g. antipyretics or anti-cough. Also the thesis reported that antibiotics if used to treat sore throat or rhinitis have minimal or no benefit on the clinical outcome. Such antibiotic use is not only unnecessary but increases the risk of bacterial resistance and treatment ailure for any subsequent invasive infection besides the risk of causing unnecessary adverse reactions [28].

Limitation of the Study

The main Limitation of this study is data were gathered from participants from Benghazi city only and no comparison with parents from rural area to identify their knowledge level regarding antibiotics use in pediatrics. However, considering the study sample was good.

Many knowledge items were not taken into consideration better if taken , such as the most commonly antibiotic, the source of information about of antibiotics among study population that could be from previous experiences or internet or relative and friends or from books and magazine, or from health workers and not remember or no answer. An acquiescence bias might exist in the parents' " questionnaire where participants tend to agree or give positive answers on some statements.

CONCLUSION

Among 2000 participants included in the survey, most of parents were mothers and most of the mothers responded very well for the survey.

In general, we conclude that the vast majority of parents were use antibiotics without prescription from the doctors when their children sick and had fever and expected pediatricians to prescribe antibiotics for their children and due to the lack of aware of the risks associated with use of excessive antibiotics.

Furthermore, there were many reasons for purchasing antibiotics without prescription such as long waiting time at clinics then previous experience with similar antibiotics also expenses involved in visiting private and public clinics, and the ease of obtaining antibiotics private pharmacies.

An overall, participant's knowledge regarding antibiotics use in pediatrics was (intermediate score) 60 % with negative attitude and poor practices towards antibiotics use in children at Benghazi city.

Mistaken beliefs and behaviors among parents, that buying antibiotics from the pharmacy when their children were sick without prescription from the physician, because it is well known that in Benghazi-Libya there is broad accessibility to antibiotics without prescription in all the pharmacies. Finally our conclusion, we are under high risk of antimicrobial resistant (AMR) spread due to misuse of antibiotics.

RECOMMENDATIONS

1. Immediate action should take place on the medical educational and professional levels, in addition to the governmental and population levels, to reduce inappropriate use of antibiotics. To solve the problem, large-scale educational programs on appropriate antibiotic use will be required as well as more stringent enforcement of prohibitory regulations on non-prescription sales of antibiotics. So, continuous health education and awareness campaigns should mainly target pharmacists and parents**,** and urges the need to further educate parents about misuse repercussions.
2. Doctors and hospitals should be liberated from drug profits from unnecessary antibiotic prescriptions, and lead to change social norms of antibiotic misuse. Only when antibiotic misuse among children is addressed by considering the underlying impact of local environments and the interests of stakeholders, can the problem be effectively handled. In addition, the community pharmacy framework can also be a great way to provide good education on antibiotics. The order of Pharmacists, the Ministry of Public Health and community pharmacists can collaboratively play a crucial role in enhancing public awareness about antibiotics use, misuse and antibiotic resistance.
3. We encourage pharmacists to refrain from dispensing these agents without a prescription and to discourage patients from obtaining antibiotics for self-treatment without the supervision of physician pharmacists don"t have enough time to counsel patients because of the decreased number of staff and the financial situation of community pharmacists.
4. Clinicians should encourage parents not to use antibiotics without prescription in their children and warn them about potential side-effects and the emergence of antibiotic resistance. So, both the pharmacists and physicians should establish a dialogue with patients to discuss how antibiotics work, what types of infection they treat, what are the appropriate treatments for URTI (symptomatic therapy), and how to prevent antibiotic resistance.
5. Training on appropriate antibiotic use must be conducted for health professionals in not only public but also private sectors.
6. Establish national guidelines recommendations for use of antibiotics.
7. It is indispensable to develop health policies that can limit the acquisition of antibiotics without prescription in our country. Coordinated efforts to implement new policies, renew research efforts. Development of policies aimed at raising awareness and establishing effective countermeasures to prevent the misuse of antibiotics are also essential.

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