

**KNOWLEDGE ATTITUDE AND PRACTICE REGARDING ANTIBIOTIC USE, A
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ABSTRACT

Background: antibiotic is any substance that has been produced by microorganisms to arrest the growth of other microorganisms in high dilution. **Objectives:** to estimate the proportion of knowledge, attitude appropriate belief and good behavior regarding antibiotic use and to find the association between these with participant's socio-demographic characteristics and other study variables in primary health care centers. **Design:** descriptive cross-sectional study done from beginning of May 2017 to end of July 2017 collected 2 days per week, 4 hours/day during the period of study, convenient sampling (429 participants) were participated, the questionnaires were filled by distributing the paper of questionnaires among visitors in primary health care centers (P.H.C.C) and ask them to fill it, after take the verbal consent, p -value of ≤ 0.05 was considered as statistically significant. **Results:** from 429 participants (48,8%) presented with age between 18-27years, (57.3%) of them were female, (86.6%) came from urban area, (36.6%) of them were employed, (67.5%) of them were married, (39.8%) were with secondary education. (58.7%) have no relative with health job, (64.8%) presented with no visit to (P.H.C.C) during the last year, (54,5%) had appropriate knowledge, (45.5%) poor knowledge, (26,61%) had appropriate attitude, (73,4%) poor attitude, (43,9%) had poor practice and (56,1%) had appropriate practice about antibiotic use. **Conclusion:** This study has been found approximately half of the participants have appropriate knowledge and two thirds of them have poor attitude while approximately half of them have appropriate practice. There was significant association between knowledge and sociodemographic characteristic; there is association between attitude and residence, occupation and educational level but not with age, gender and marital status. Also there is association between behavior and age, residence, occupation and educational level but not with gender and marital status. There was strong association between knowledge and practice with other study variables, and there was association between attitude and presence of relative with health job, but not with number visits to the clinic in the last months.

KEYWORDS: There was significant association between attitude and presence of relative with health job, but not with number visits to the clinic in the last months.

INTRODUCTION

Antibiotic can be defined as any agent that inhibits bacterial growth or kills bacteria. In other word, antibiotic is any substance that has been produced by microorganisms to arrest the growth of other microorganisms in high dilution.^[1] 'No Action Today, No Cure Tomorrow' is the announcement of World Health Organization (WHO) in 2011 as a theme of World Health Day as 'Combat Antimicrobial Resistance'.^[2] Several recent studies have been highlighted the importance of antibiotic overuse and or misuse and considered the urgent new strategies development for prevention of resistance of bacteria to antibiotics.^[3,4,5]

Since the use of antibiotics worldwide, the opportunities of developing drug resistant microbes are much higher, besides, the fluctuating of governments regulations about

antibiotics obtain with proper prescription were the most leading cause of antibiotics misuse and or overuse.^[7,8] Furthermore, physicians adapted to use similar empirical therapy before identification of the bacteria whatever the possible test results in. This habitual use of the same antibiotic regimen for all patients can be attributed to increase antibiotics resistance as well as rates of inadequate coverage.^[9,10] Antibiotics are considered among the most commonly sold medications in the developing countries.^[11] The irrational and overuse of antibiotics result not only in the emergence of resistant bacterial strains but also in adverse reactions and economic burden on health system.^[12] This irrational use arise from economic factors, health policies concerning medical insurance, lack of physicians concerns about long term resistance and effects versus treating current symptoms, pharmaceutical marketing and the sale of antibiotics without prescriptions in some countries.^[13,14]

The objectives of his study were

- a. To determine the proportion of knowledge, attitude and practice regarding antibiotic use, in people attending PHCC.
- b. To find the association between knowledge, attitude and practice regarding antibiotic use with participants' socio-demographic characteristics and other study variables.

LITERATURE REVIEW**2.1: History of Antibiotics**

An antibiotic term was first used to describe class of molecules that directly antagonized the growth of microorganisms by Selmon Walksin in 1941. Meanwhile, this descriptive study returns back to the compounds that neutralized the effects of infectious microbes in the late nineteenth century.^[15] However, the early introduction of antibiotics like pyocyanase and salvarsan that inhibited the growth of infectious microorganisms very well, meanwhile, their toxic and unstable effects stop their use as a practical medical treatment.^[16]

However, penicillin was firstly in 1928 by Alexander Fleming as a first true antibiotic that was effective, reliable, and safe to use in humans.^[17] Meanwhile, bacterial penicillinase was identified in 1940 as resistant strains capable of inactivating penicillin as well as, synthetic studies were undertaken to modify penicillin chemically to prevent cleavage by penicillinases namely, (lactamases). Although, penicillin gained its globally attention when it was used to combat infection in burn victims after the Cocoanut Grove fire of 1942.^[18] However, it was used as one of the most successful medical treatments in the history of mankind. Since this event, Fleming recognized the potential for the development of antibiotic resistance, and cautioned the audience at his Nobel Prize acceptance speech. Furthermore, sulfonamides are the first effective antibiotics that have been introduced since 1937, later on the resistance mechanism have been recognized. 1944 presented the introduction of streptomycin for the treatment of tuberculosis mutant strains of *Mycobacterium tuberculosis*.^[19,20,21]

2.2: Classification of Antibiotics

Antibiotics can be classified according to mechanism of action into.^[20]

- 1-Cell wall synthesis inhibitor such as B-lactams (penicillin, cephalosporines), lipopeptides (polymyxin B) and others such as Bactiracin, alafofalin.
- 2-DNA synthesis inhibitors such as fluoroquinolones (Nalidixic acid, ciprofloxacin, sulfadiazine), sulfonamides (sulfamethazin, sulfadiazine) and others such as novobiocin.
- 3-RNA synthesis inhibitors such as rifamycins (rifampicin, rifaximin).
- 4-protein synthesis inhibitors such as tetracycline (tetracycline, doxycycline), aminoglycosides (gentamicin, amikacin, streptomycin) Macrolides

(erythromycin, clarithromycin, azithromycin), ampheniclos (cholarmphenicol, thiamphenicol), licosamindes (clindamycin, lincomycin), and pleuromulins (tiamulin).
5-DNA replication (intercalators) such as anthracyclines (doxorubicin) and others (actinomycin D, Mithramycin).
6-Anaerobic DNA inhibitors such as nitrofurans (furazolidone, nitrofurantoin and nitro-imidazole (orindazole).^[22]

Another classification of antibiotic is according to spectrum of action^[23]. This classification depends on the range of bacterial species susceptible to these agents.

1-broad spectrum antibiotics are active against both gram positive and gram negative organisms example. Tetracycline, phenicols, fluoroquinolones, third generation cephalosporines.

2-narrow spectrum antibiotics are of limited activity and are primarily only useful against particular species of microorganisms for example glycopeptides and bactiracin are only effective against gram positive, whereas polymixins are usually only effective against gram negative, aminoglycosides and sulfonamide are only effective against aerobic organisms, while nitromidazole effective against anaerobic organisms.^[23]

2.3: Antibiotic use in upper respiratory tract infection (URTIs)

Most URTIs occur more frequently during the cold winter months because overcrowding, adults develop 2-4 colds annually.^[24]

Although viruses cause most (URTIs), antibiotic continue to be inappropriately widely prescribed for these illnesses.^[25] Data have clearly shown that individuals prescribed AB. For (URTIs). Became at least twice Ensuing 12 months compared to those who are not prescribed AB.^[26] unnecessary adverse effects of AB. And development of antimicrobial resistance can be reduced by judicious use of these drugs, health care providers should educate their patients about the self-limited nature of most (URTIs) and the hazard of inappropriate use of AB. For the individual and the community.^[24]

Antibiotics are currently prescribed to 41% of patients with suspected viral pharyngitis; ranking third among activities thought to be in common practices but of little benefit.^[27] Although office visits for (URTIs) in people > 5 years did not decrease from 1995-2006, antibiotic prescription decreased by 18%.^[25] Antibiotics are the second most common cause of adverse drug events in the elderly with a risk comparable to insulin, warfarin and digoxin.^[25]

There are three principles of AB. Use for adults with non-specific (URTIs) apply to whom without complicating comorbid conditions such as chronic lung disease or heart disease.^[28]

1-the diagnosis of non-specific (URTIs) or acute rhinopharyngitis should be used to denote an acute infection that is typically viral in origin and in which sinus, pharyngeal and lower respiratory symptoms, although frequently present are not prominent.

2-antibiotics treatments of adults with non-specific (URTIs) does not enhance illness resolution and is not recommended. Studies specially testing the impact of antibiotic treatment on complications of non-specific (URTIs) have not been performed in adults.

3-purulent secretions from the nares or throat (common cold) observed in patients with (URTIs) predict neither bacterial infection nor benefit from antibiotic treatment.^[28]

2.4: Antibiotics Misuse at Patients Level

There are multiple causes beyond antibiotics misuse by patients which could be either due to patients fail to finish the whole course of antibiotic, or patients take the antibiotics by themselves without the prescription and advice of doctors, Furthermore, antibiotic misuse may be because of patients take the antibiotics left by previous visit to physician and or patients share antibiotics with families. However, patients' knowledge about antibiotic use forced by their no attention about proper type, dose and time of antibiotic they have to use. So far, more inappropriate use of antibiotics, more serious antibiotics resistance will be, Recent studies reported that, the people who lack the awareness about dangers of inappropriate antibiotics use were more likely to have antibiotics misuse behavior.^[29,30,31]

However, misunderstanding of antibiotics use have been positively associated with unnecessary over/misuse of antibiotics in a significant level attributed the inappropriate use of antibiotics to consequent of lack of knowledge.^[31,32] Moreover, a study was has been carried out by Mainous to assess patient education and its effect on decreasing the antibiotics misuse, However the findings were patients' education had a little impact on promoting patients' proper use of antibiotics. The antibiotics misuse still high after patients' education, However to improve the antibiotics use, more studies should be carried out to reach optimal knowledge.^[33]

2.5: Antibiotics Misuse at Physicians' Prescription Level

The major source of inappropriate use of antibiotics was the irrational prescription doctors whether presented as inappropriate choice or dosage. Several studies have been conducted to investigate the physicians' antibiotics use generally at different bases hospital and or community. However, hospital-based studies have been focused on the antibiotics prescription for inpatient. Turkey study by Tünger et al, 2000 in a university hospital revealed that, the inappropriate use of antibiotics was higher among patients of surgical ward in comparison with medical ward; however, only 4.7% of prescribed antibiotics were based on the result of

therapeutic culture. Meanwhile, most of the antibiotics prescriptions were empiric decisions (71.4%).^[34]

So far, overuse/ misuse of antibiotics at hospital and community bases are unnecessary and have been attributed to great wastage of resource, presenting a major threat to public health. However, restriction policy on antibiotics use was needed to reduce consumption and expenditure of antibiotics without infection and mortality rate increase at public level.^[35,36]

One of the important reasons for inappropriate use of antibiotics in hospitals can be attributed to nosocomial infection. Although, it increases the possibility of resistance emergence, however, it is a vicious circle that need breakup by appropriate policies for antibiotics use in the hospital as well as community bases.^[35,36]

On other hand, private physicians' clinics represented the other main source of antibiotic overuse/ misuse rather than nosocomial infection. They are relatively more independent, have more freedom in prescription. Many studies have been revealed that, over 50% of the patients approved that physicians of private clinics adapted to prescribe antibiotics for the patients with upper respiratory tract infections due to viral causes in order to satisfy the patients or fear of medico-legal issues. Upper respiratory tract infections represent the most common cause of antibiotics overuse/ misuse, however, most of these infections are caused by virus and there are no roles of antibiotics use in symptom relief or recovery. However, other studies showed that, physician appeared to misunderstand their patients in most of the cases.^[37,38,39,40,41]

Stivers et al 2003, reported that the communication behaviors that have been applied by patients' caregivers like giving diagnosis and or disagree with diagnosis during observation increase the ability that physicians would perceive them inappropriate antibiotics.^[42] Other reason of physicians inappropriate description were patients or their caregivers did not agree with antibiotics prescription, but their physician thought they wanted to have as well as did not satisfied. Patients' satisfaction who did not receive antibiotics did not decrease.^[40,41,42,43] Other reasons of physician inappropriate prescription rather than patient-doctor relationship are doctor-hospital relationship, clinical workload, financial pressure, social, political, economic situation, aging population, increase health resource and staffs and public medical insurance.^[40,41,42,43,44,45]

2.6 Knowledge, Attitude and Practice of Antibiotics Use

There is multiple features make human behavior as a complex process and different from other mammals. It achieves this behavior by knowledge about and attitude towards the practice, perceived social standards and self-efficacy.^[46,47] For improving adherence to infection control measures need to make careful behavior for

barriers changes. However, knowledge and attitude of patients should be assessed both. Meanwhile, self-reported behavior it is difficult to convince who has very favorable opinion about his own behavior. Recent multiple studies have been carried out investigate knowledge, attitudes and behavior in relation to antibiotic use either by introducing questionnaires or by observations. However these studies found that the best patients' knowledge have been associated with better nurse and physician' attitude and practice.^[48,49,50,51,52]

People's misconceptions of antibiotics can potentially lead to in appropriate self-medication with either prescribed or non-prescribed antibiotics, review about antibiotic use in developing countries reported that people believed antibiotics as "an extraordinary medicine "or a "strong medicine "which are able to prevent and cure any disease or symptoms, patients demand for antibiotic prescription and the practice of using AB. Without prescription by community members is influenced by such misconceptions.^[53]

Knowledge and attitude are social cognitive factors at an individual level that influences health related behavior, including the behavior of using AB. Knowledge itself is not enough to change behavior, but does play an important role in shaping beliefs and attitude regarding a particular behavior, consequently in the context of AB. Use, in appropriate knowledge of using AB. Correctly potentially lead to misconceptions regarding such use.^[53]

MATERIALS AND METHODS

3.1: Setting

Study design: descriptive cross sectional study.

Conducted over the period from the beginning of May-end of July 2017 as two days/week, at.

1. Al_Ghazaliah center for primary health care.
2. Al_Salam primary health care of family medicine.
3. Saif zaki Al_saad center for primary health care.

Sampling and sample size: convenience sampling involved 492 participants.

Inclusion criteria: participants aged ≥ 18 who had given consent to participate in a questionnaire from which prepared to collect information.

Exclusion criteria: Severely ill patients.

3.2: Data collection

Data collected using a self-administered questionnaire appendix 1, Appendix2, depending on distributing the paper of questionnaire in Arabic language on participants and ask them to fill it after taking the oral consent.

The questionnaire includes four parts

First Part Contain

- General demographic information: age, gender, address, occupation, educational level, and marital status.

- The participant also asked about the no. of visits to the clinic in the last (12) months.
- If the participant had a relative with health job.

Second Part Contains

Questions to determine participant's degree of knowledge about antibiotic and these are.

1-What is antibiotic? Medicine for bacterial or viral fungal or it's for arthritis and inflammation or it's to stop fever and painkiller medicine.

2-If your symptoms improving you can stop taking antibiotic and it the participant (agree, disagree or do not know).

3-If the full course of antibiotic is not finished the effectiveness of treatment is reduced (agree, disagree or don't know).

4-If the person is repeatedly treated with the same antibiotic and does not complete the treatment he may be infected with bacteria that are difficult to treat (agree, disagree or do not know)

5-If the antibiotic is over used in the community it will not be effective in treating infections (agree, disagree or don't know) knowledge score was determined by calculating the number of correct responses to these five questions poor and appropriate knowledge was defined as total score of (0-2) and (3-5) respectively.^[30]

Third Part Contains

Four questions on attitude a in which each one had three choices including (agree, disagree or do not know) the following.

1. If I had sore throat and runny nose, I should take an antibiotic
 2. If I had sore throat, runny nose, cough and fever, I should take an antibiotic?
 3. If I visit a doctor for sore throat and runny nose, I would expect a prescription of antibiotic?
 4. If one of your family member experience similar symptoms your give him/her your antibiotic?
- Was given to poor attitude, do not know and appropriate attitude and (9-12) as appropriate attitude.^[30]

Forth Part Contains

Eight questions on practice and these are

- 1- In the last episode of upper respiratory tract infection where did you seek your medical care (doctor, nurse, pharmacists, family member, other)
- 2- From where do you get your antibiotic (hospital clinic, pharmacy, family, friends)
- 3- If you missed taking a dose of antibiotic what did you do (continue as usual, take the next dose as soon as I remember, double the next dose).
- 4- If your symptoms persists what would you do? (continue the usual dose, increase the dose, increase the number of times you take the antibiotic, consult your doctor)
- 5- If experience side effects (rash, swelling) from AB. What would you do? (Stop taking AB, consult health care professionals, ignore the side effect).

- 6- When you receive AB do you complete the course of treatment? (agree, disagree, do not know)
- 7- Do you keep the left over AB. For future use?(agree, disagree, do not know).
- 8- Do you use AB without doctor prescription? (agree, disagree, do not know). Practice score was determined by calculating the No. of correct responses to these 8 questions, poor and appropriate practice was defined as total score of (0-5) and (6-8) respectively.

3.3: Statistical Analysis

Descriptive Statics: frequency tables (numbers and percentages).

Analytic statistics: The data were analyzed using SPSS and Excel program, chi-square test was used to find any association between variables, and fisher exact test were used to increase the validity of chi-square test p-value < 0.05 considered statistically significant.

3.4: Ethical consideration

- After brief explanation of the general purpose of the study and it's objectives, oral consent was obtained from each participant.
- Permission was taken from centers where the information gathering from each one.

3.5: Pilot study

A preliminary pilot study was carried out on a small group of 20 participants Who attend P.H.C.C. (this group of participants was excluded from the study Sample) to.

1-Assess the practicality of questionnaire and time needed to fill it.

2-To detect any difficulties might be faced during the data collection.

3- Adjustment of questionnaire to gain training.

3.6: Limitation of the study

1-There was a shortage of time to get the data and included larger no. of study sample.

2-Females were more cooperative than male in this study.

RESULTS

4.1 The Distribution of patients by Socio-Demographic Characteristics

Table 4.1 shows the distribution of 492 participants according to socio-demographic characteristics. Majority (48.8%) of them presented with age between 18-27 years. (57.3%) of them were female. (86.6%) of them came from urban area. (36.6%) of them were employed.(67.5%) of them were married. (39.8%) presented with secondary education. (58.7%) of them had no relative job. (67.9%) of respondents did not visit clinic in last year.

Table 1: Distribution of participants according to socio-demographic characteristics.

Characteristic		Number(%)
Age Groups	18-27 years	240 (48.8)
	28-37 years	118 (24.0)
	38-47 years	68 (13.8)
	48-57years	45 (9.1)
	58-67years	21 (4.3)
Gender	Male	210 (42.7)
	Female	282 (57.3)
Residence	Urban area	426 (86.6)
	Rural area	66 (13.4)
Marital status	Married	330 (67.5)
	Single	130 (26.4)
	Widow	30 (6.1)
Occupation	Employee	180 (36.6)
	Not-Employed	100 (20.3)
	Student	101 (20.5)
	Other	111 (22.6)
Educational level	Higher education	184 (37.4)
	Secondary	196 (39.8)
	Primary	99 (20.1)
	Illiterate	13 (2.6)
Have a family member whose job is health related	Yes	203 (41.3)
	No	289 (58.7)
No. of visit to the clinic in last 12 months	None	334 (67.9)
	1- 5 visits	132 (26.8)
	> 5 visits	26 (5.3)

Table 2: Distribution of participants according to study variable.

Characteristic		Number(%)
Have a relative whose job is health related	Yes	203(41.3)
	No	289(58.7)
No. of visit to the clinic in last 12 months	None	334(67.9)
	1-5 visits	132(26.8)
	>5 visits	26(5.3)

The table show that 58.7% of participants have no relative with health job, 67.9% of them did not visit the clinic in the last 12 months.

Table (3): distribution of participants according to knowledge score.

The table show that 42.8% of participants knows that AB.Is a medicine for bacterial infection, 51.8% stop taking AB. If their symptoms improving, 63.2% think that effectiveness of AB. Reduced if not finish the course, 56% knows that AB. Resistance can occur if the person is repeatedly treated with the same AB. 58.7% think that AB. Will not be effective if it is overused in the community.

Table (3): Distribution of participants according to knowledge score.

Questions		No.(%)
1) What is an antibiotic?	Medicine for bacterial infection	211(42.8)
	Medicine for viral infection	150(30.5)
	Medicine for fungal infection	
	Medicine for arthritis and inflammation	50(10.2)
	Agree	39(8)
	Disagree	
	Do not know	25(5)
2) You can stop taking a full course of AB. If your symptoms are improving.	Medicine for stop fever	17(3.5)
	Pain killer medicine	
3) The effectiveness of treatment is reduced if a full course of AB.Is not finished.	Agree	175(35.6)
	Disagree	255(51.8)
	Do not know	62(12.6)
4) One may be infected with bacteria that are difficult to treat if this person is repeatedly treated with same AB. And does not complete the course of treatment	Agree	311(63.2)
	Disagree	150(30.5)
	Do not know	31(6.3)
5) An antibiotic will not be effective for treating infections if it is over used in the community	Agree	276(56.1)
	Disagree	125(25.4)
	Do not know	91(18.4)
5) An antibiotic will not be effective for treating infections if it is over used in the community	Agree	289(58.7)
	Disagree	78(15.9)
	Do not know	125(25.4)

- About (45.50%) of them had poor knowledge about antibiotic use. 54.50% have appropriate knowledge about antibiotic use.

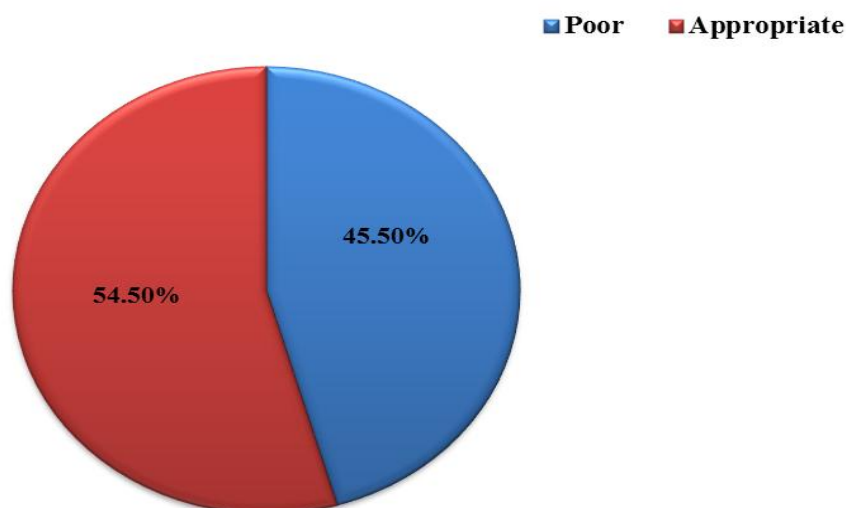


Figure 1: Shows the distribution of participants according to their knowledge score regarding antibiotic use.

Table 4 shows distribution of participants by practice, (47.0%) take their medicine from doctors. (38.0%) their source of AB was from hospital/clinic.(58.9%) of participants double the next dose of missed taking AB. (69.0%) consult doctors in case in case of persist symptoms 73.2% consult a health care professionals

when experience side effect from taking antibiotics. 35.8% keep the over antibiotic for future use, 78.6% disagree to use AB. Without doctor prescription, 78.6% agree to complete the course of treatment if they receive AB.

Table 4: Distribution of participants according to practice.

Characteristic		No.(%)
In last episode of upper respiratory tract infection where did you seek medical care	Doctor	231(47.0)
	Nurse	145(24.4)
	Pharmacist	96(19.6)
	Family member	12(2.4)
	Other	8(1.6)
Who prescribe AB.for you?	Doctor	187(38.0)
	Pharmacy	141(28.7)
	Family	74(15.0)
	Friends	90(18.3)
If you missed taking a dose of AB what would you do?	Take the next dose as soon as I remember	202(41.1)
	Double the next dose	290(58.9)
If your symptoms persist what would you do?	Continue the usual dose	93(18.9)
	Increase the dose	35(7.1)
	Increase the No. of times you take the AB	25(5)
	Consult the doctor	339(69.0)
If you experience side effect from taking AB what would you do?	Stop taking AB	86(17.5)
	Consult a health care professionals	360(73.2)
	Ignor the adverse effects	46(9.3)
Did you keep the leaflet over AB for future use ?	Agree	176(35.8)
	Disagree	116(23.6)
	I do not know	200(40.6)
When you receive AB. Do you complete the course of treatment?	Agree	387(78.6)
	Disagree	40(8.2)
	Do not know	65(13.2)
Do you use AB. Without doctor prescription?	Agree	75(15.2)
	Disagree	387(78.6)
	Do not know	30(6.2)

- (73.4) of them had poor attitude about antibiotic use. 26.6% of participants are with appropriate attitude.

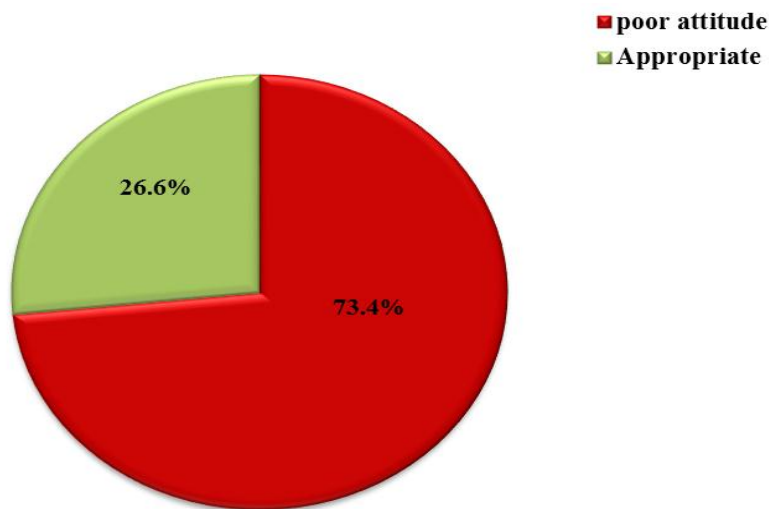


Figure 2: Shows the distribution of participants according to their attitude score regarding antibiotic use.

Table 5: This table shows that (48.8%) of participants agree to take AB. If they have cold symptoms, (50.8%) agree to take AB. If they have cold symptoms plus fever and cough, (40.6%) expect a prescription of AB. For

cold symptoms if they visit a doctor, (44.7%) of participants give their AB. To their family member if experience similar symptoms.

Table 5: Distribution of participants according to attitude score.

Question		No.	(%)
If I had sore throat and runny nose, I should take an antibiotic?	Agree	240	(48.8)
	Disagree	150	(30.5)
	Do not know	102	(20.7)
If I had sore throat, runny nose, cough and fever, I should take an AB?	Agree	250	(50.8)
	Disagree	131	(26.6)
	Do not know	111	(22.6)
If I visit a doctor for sore throat and runny nose, I would expect a prescription of AB?	Agree	200	(40.6)
	Disagree	122	(24.8)
	Do not know	170	(34.6)
If one of your family member experience similar symptoms you give him/ her your AB.?	Agree	220	(44.7)
	Disagree	122	(24.8)
	Do not know	150	(30.5)

- About 43.9% of them had poor practice about antibiotic use. 56.1% have appropriate practice.

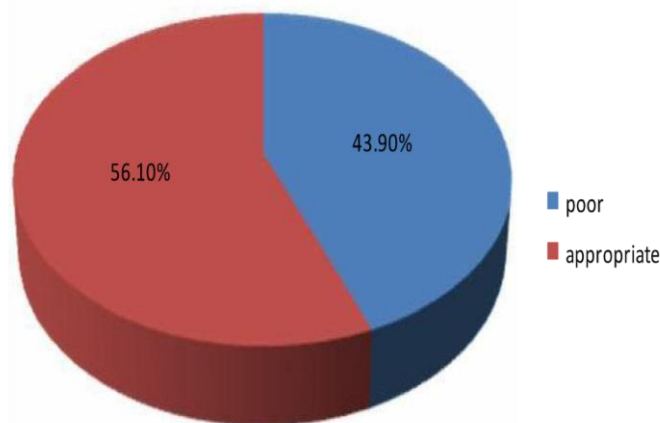


Figure 3: Shows the distribution of participants according to practice score regarding antibiotic use.

4.4 The Association between knowledge, attitude and practice regarding Antibiotic use and study variable

Table 6: shows the association between knowledge regarding antibiotic use (poor or appropriate) and socio-

demographic characteristic. There was significant association between this result and all these characteristics.

Table 6: Association between knowledge regarding antibiotic use and Socio-demographic characteristics.

Characteristic		Knowledge		P-Value
		Appropriate (%)	Poor (%)	
Age groups	18-27 years	135(50.46)	105(46.9)	<0.001
	28-37 years	74(27.6)	44(19.6)	
	38-47 years	40(14.9)	28(12.5)	
	48-57 years	13(4.9)	32(14.3)	
	58-67 years	6(2.2)	15(6.7)	
Gender	Male	127(47.4)	83(37.1)	0.021
	Female	141(52.6)	141(62.9)	
Residence	Urban area	268(100.0)	158(70.5)	<0.001
	Rural area	0(0.0)	66(29.5)	
Marital status	Married	175(65.3)	157(70.1)	<0.001
	Single	85(31.7)	45(20.1)	
	Widow	8(3.0)	22(9.8)	
Occupation	Employee	142(53.0)	38(17.0)	<0.001
	Non-Employee	41(15.3)	59(26.3)	
	Student	69(25.7)	32(14.3)	
	Other	16(6.0)	95(42.4)	
Educational level	Higher education	151(56.3)	33(14.7)	<0.001
	Secondary	104(38.8)	92(41.1)	
	Primary	13(4.9)	86(38.4)	
	Illiterate	0(0.0)	13(5.8)	

Table 7: Association between knowledge regarding antibiotic use and study variables.

There is significant association between knowledge and study variables.

Variable		Knowledge		P-Value
		Appropriate (%)	Poor (%)	
Number of visits	None	194(72.4)	140(62.5)	0.042
	1-5 visits	64(23.9)	68(30.4)	
	≥5 visits	10(3.7)	16(7.1)	
Relative with health job	Present	163(60.8)	40(17.9)	<0.001
	Absent	105(39.2)	184(82.1)	

Table 8: shows the association between attitude regarding antibiotic use (appropriate or poor attitude) and socio-demographic characteristics including (age, gender, residence, marital status, occupation and

educational level). There is significant association between that result and residence, occupation and educational level, while there is no significant association between that result and other study variables.

Table 8: Association between attitude regarding antibiotic use and socio- demographic characteristics.

Characteristic		Attitude		P-Value
		Appropriate (%)	Poor (%)	
Age groups	18-27 years	67(51.1)	173(47.9)	0.561
	28-37 years	28(21.4)	90(24.9)	
	38-47 years	21(16.0)	47(13.0)	
	48-57 years	12(9.2)	33(9.1)	
	58-67 years	3(2.3)	18(5.1)	
Gender	Male	65(49.6)	145(40.2)	0.061
	Female	66(50.4)	216(59.8)	
Residence	Urban area	131(100.0)	295(87.7)	<0.001
	Rural area	0(0.0)	66(18.3)	
Marital status	Married	84(64.1)	248(68.7)	0.056
	Single	43(32.8)	87(24.1)	
	Widow	4(3.1)	26(7.2)	

Occupation	Employee	64(48.9)	116(32.1)	<0.001
	Non-Employee	20(15.3)	80(22.2)	
	Student	31(23.7)	70(19.4)	
	Other	16(12.1)	95(26.3)	
Educational level	Higher education	70(53.4)	114(31.6)	<0.001
	Secondary	48(36.6)	148(41.0)	
	Primary	12(9.2)	87(24.1)	
	Illiterate	1(0.8)	12(3.3)	

Table 9: shows the association between attitude regarding antibiotic use (appropriate or poor attitude) and number of visits to PHC in the last year and presence of relative with health job. There was significant

association between that result and presence of relative with health job, while there was no significant association between that result and number of visits to PHC in the last year.

Table 9: Association between attitude regarding antibiotic use and study variables.

Variable		Attitude		
		Appropriate (%)	Poor (%)	P-Value
Number of visits	None	96(73.3)	238(65.9)	0.284
	1-5 visits	30(22.9)	102(28.3)	
	≥5 visits	5(3.8)	21(5.8)	
Relative with health job	Present	83(63.4)	120(33.2)	<0.001
	Absent	48(36.6)	241(66.8)	

Table 10: shows association between practice regarding antibiotic use (appropriate or poor practice) and socio-demographic characteristics. There was a significant association between that result and age, residence,

occupation and educational level. While there was no association between this result with gender and marital status.

Table 10: Association between practice regarding antibiotic use and socio-demographic characteristics

Characteristic		Practice		P-Value
		Appropriate (%)	Poor (%)	
Age groups	18-27 years	185(48.6)	55(49.1)	0.002
	28-37 years	110(28.6)	20(18.1)	
	38-47 years	54(14.1)	15(13.4)	
	48-57 years	23(6.5)	14(12.5)	
	58-67 years	8(2.2)	8(6.9)	
Gender	Male	156(41.1)	54(48.2)	0.178
	Female	224(58.9)	58(51.8)	
Residence	Urban area	340(89.5)	86(76.8)	0.001
	Rural area	40(10.5)	26(23.2)	
Marital status	Married	105(27.6)	25(22.3)	0.459
	Single	251(66.1)	81(72.3)	
	Widow	24(6.3)	6(5.4)	
Occupation	Employee	152(40.0)	28(25.0)	<0.001
	Non-Employee	71(18.7)	29(25.9)	
	Student	88(23.2)	13(11.6)	
	Other	169(18.2)	42(37.5)	
Educational level	Higher education	6(1.6)	7(6.3)	0.002
	Secondary	67(17.6)	32(28.5)	
	Primary	156(41.1)	40(35.7)	
	Illiterate	151(39.7)	33(29.5)	

Table 11: shows association between practice regarding antibiotic use (appropriate poor practice) and number of visits to PHC in the last year and presence of relative with health related job. There were significant associations between the number of visits to PHC in the last year and presence of relative with health job.

Table 11: Association between practice regarding antibiotic use and study variables.

Variable		Practice		
		Appropriate (%)	Poor (%)	P-Value
Number of visits	None	281(73.9)	67(60.2)	0.001
	1-5 visits	89(23.5)	35(31.0)	
	≥5 visits	10(2.5)	10(8.8)	
Relative with health job	Present	179(47.1)	24(21.4)	<0.001
	Absent	201(52.9)	88(78.6)	

5.1: DISCUSSION

Antibiotic resistant is strongly associated with improper usage of antibiotic prudent antibiotics use is essential for preserving their clinical effectiveness, while the reduction of unnecessary use will decrease antibiotic resistant, beside the rescibers, the end of users of antibiotic are also essential to the control of antibiotic use and resistance.^[30]

5.2: Knowledge Attitude and Practice Proportion

- Regarding to knowledge attitude and practice we found that 54. 5% of our study sample have appropriate knowledge, 73.4% with poor finding have been agree and or disagree with finding of other studies, that have been carried out in regional countries and else- where globally.
- Our knowledge result is agree with Hong Knong 2008^[30] shehadeh 2012^[54], suaifan study.^[55] Iran 2012^[56], Malaysia 2011^[57] but disagree with Al-Zoubi 2013^[58], Taiwan 2005.^[60] And Syria 2010.^[61]
- Regarding to attitude our result is disagree with Hong Kong 2008^[30], suaifan 2012^[55], Iran 2012^[56], Malaysia 2011^[57] but agree with shehadeh 2012.^[54] This high no. of disagreement between our result and other studies results may be due to the fact that most people in our community think that should take an antibiotic when they have cold symptoms and request an antibiotic prescription from Doctor when they visit P.H.C.C.
- Regarding to practice our result is agree with Hong Kong 2008^[30], suaifan 2012^[55] and Malaysia 2011.^[58] But disagree with shehadeh 2012^[54] and Iran 2012.^[56]
- There are many variation related to the use of AB in different countries and study settings regarding to practice.
- In this study we found that 42.81% of participants know that AB. Is used for bacterial infections, in Malaysia study 2011^[57] know that AB is for bacterial infections in Al-Zoubi study 2013^[58] it's 2011.
- In this research we found that 51.8% of participants stop taking AB if their symptoms are improving, 63.2% agree that effectiveness of treatment is reduced if the full course of AB is not finished, 56.1% of participants agree that person may be infected with bacteria that are difficult to treat if repeatedly treated with the same AB., 58.7% agree that the effectiveness of AB is reduced if it is over used in the community.
- This study found that 48.8% of participants take should take AB if they have runny nose and sore throat, and 50.8% agree that they should take an AB of they had runny nose, sore throat, cough and fever, also 40.6% of participants expect a prescription of AB.
- Regarding of sharing AB with family member if experience similar symptoms (47.7%) share AB with their family, in Italy study 2013^[59] 47.3% of participants shore their AB. With family member if one of them experience similar symptoms.
- In this study we found that 47% of participants in their last episode of upper respiratory tract infection take their care from care from doctor. In Hong Kong 2008^[30] 91.5% take their care from doctor in their last episode of upper respiratory tract infection this difference may be due to the fact that I mentioned above as people in our community think that when they have cold symptoms they take an AB. And gets better or symptoms disappear so no need for visiting doctor while the Hong Kong people have more awareness about AB. Use and side effects so they don't use AB. Without doctor prescription.
- We also found that 38% of the participants take their AB from Doctor. Whereas 28% take it from pharmacy. This result clear that doctor have a role in antibiotic misuse as they prescribe AB. To those patients when they visit them even if they don't need it. Also there is no role in our community that limit or prevents the sale of AB. By pharmacists without doctor prescription, in Hong Kong 2008.^[30] 9% of participants only take AB. From pharmacy because of high restriction of saling AB by pharmacists in Hong Kong community while in Italy 2013^[59] 43.1% take their AB from pharmacy even in this community there is restriction of saling AB by pharmacist. In Syria 2010^[61] 43% get their AB from doctor 57% from family and friends. We also found that 35.8% of participants keep left over AB for future in suaifan study 2012^[56] 73.1% and in Tiawan 2005^[60] 53.1%.
- This study found that (78.6%) of participants complete their course of treatment with AB., in suaifan study 2012^[56] 61% of participants does not complete the course of treatment of AB. in Tiawan 2005^[60] (49.8%) not complete their course of treatment.
- We also found that 78.6% of participants disagree to use AB. Without doctor prescription, in Al-Zoubi study 2013^[58] 75% disagree that AB. Could be used

with doctor prescription, in Syria 2010^[61] 43% take AB. By doctor prescription.

5.3. Association between Knowledge attitude and practice with participant's sociodemographic characteristics

- In this study we found that there is strong association between knowledge and sociodemographic data (younger age, females, lived in urban area, employed and high educational level) are associated with appropriated knowledge also participants who did not visit the P.H.C.C. in the last 12 months and have relative whose job is health related are associated with appropriate knowledge. So our education and orientation about AB use must be towards males, middle aged or older with secondary education and below. In Hong Kong 2008^[30], there was association between knowledge and (gender + educational level). Female with higher education and who visit the clinic 1-4 times associated with appropriate knowledge. In shehadeh 2012^[54], association was found between age and knowledge but not with gender and educational level. In Malaysia 2011^[57], female with higher educational level employed have appropriate knowledge. In Al-zoubi study^[58], middle age with higher educational level have higher knowledge scores. In Italy 2013^[59], higher educational level of respondents, employed and family member whose job is health related are more likely to know about AB. In syria 2010^[61], younger age males with secondary education were poor knowledge.
- Regarding to attitude participants from urban area employed and have higher level of education with presence of relative with health job. Are associated

CONCLUSION

- In this study we found that 54.5% of participants are with appropriate knowledge, 73.4% have poor attitude and 56.1% have appropriate practice.
- There is significant association between knowledge and demographic data.
- There is some association between attitude and behavior with demographic data.
- There is an association between knowledge and practice with study variables.
- There is an association between attitude and presence of relative with health job.
- Two thirds of the participants consult a health care professional when experience side effect from taking AB.
- Half of participants take their care from doctor in the last episode of upper respiratory tract infection.
- Third of participants keep the left over AB for future use.
- The result of this study identified areas of misconceptions and specific groups to be targeted for education interventions regarding AB use among general population.

with appropriate attitude while there is no association between age, gender, marital status and no. of visits to the clinic in the last 12 months.

- In Hong Kong 2008^[30], female with higher educational level and visited the clinic in the last 12 months is associated with appropriate attitude, in shehadeh 2012^[54], there was association with age but not with gender and educational level. In Malaysia 2011^[57], female with higher educational level and employed have appropriate attitude about AB use. In Al-zoubi study^[58], there was significant association between age and level of education (middle age with higher education) but not with gender and occupation. In Italy 2013^[59], younger age groups not employed and with lower education were associated with poor attitude.
- Regarding to practice younger age group with higher educational level are associated poor practice while participants who lived in urban area employed are associated with appropriate practice also participants who did not visit the clinic in the last 12 months and who have no family member whose job is health related are associated appropriate behavior, in Hong Kong 2008^[30], female with higher education and visited the clinic in the last 12 months are with appropriate practice, in shehadeh 2012^[54], middle aged participants are associated with behavior but not with gender and educational level. In Malaysia 2011^[57], female young age with high education was associated with appropriate behavior, Al-zoubi study^[58], middle age respondents with higher education are associated with appropriate behavior, in Syria 2010^[61], younger age males, with secondary education or below were with poor behavior.

Recommendation

- 1- Establishing a well planned, organized and structured educational program among adults using all media (T.V, internet, radio...) means about the illness that require antibiotic therapy as well as emphasizing when antibiotic will not do any good.
- 2- Direct patient compliance to the treatment as prescribed and emphasizing pharmacists role and responsibility in stopping antibiotic sale without prescription.
- 3- Consultation strategies and guidelines that make patient expectations explicit without damaging physician –patient relationship.
- 4- Further researchers need to be conducted in Iraq among health care providers themselves as well, some of the health care providers responsible for the misuse of antibiotic.

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