Original Article

FACTORS IMPACTING KNOWELDGE, PRACTICE AND ATTITUDE ABOUT ANTIBACTERIAL AND ITS RESISTANCE BY CROSS SECTIONAL STUDY IN IRAQ

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Abstract

Background: Poor people's knowledge, attitude, and practice (KAP) are the most imperative factors behind the emergence of antimicrobial resistance(AMR).(37.2%) of low and middle income people had a little information about antibiotics with clear deficiency of reliable research and surveillance programs about AMR .Therefore our study targeted the state of knowledge, attitude and use of antibiotics within the Iraqi community and exploring the patient's factors associated with it.

Methods: A cross-sectional observational study conducted on patients presented to microbiological lab of Al- ALSadar Medical City and Al-Zahraa Teaching Hospital / Najaf governate/ Iraq. The participants included patients presented with different kinds of infections and requested for culture /sensitivity test for organisms isolated from different sources. The total sample size were 475 patients. The data collected by validated pre-tested self-administered questionnaire. Our study registered at Clinical Trials.gov with the registration number (NCT05100407).

Results: In general, the participants had below average knowledge percentage (42%) Also, the percentage of total practice score was lower than average 42%. On the other hand, they had neutral attitude score (56%).There was a positive correlation between knowledge ,attitude and practice .Also there were many patient's characteristics had significant effect on overall knowledge, attitude and practice (KAP) about antibiotics: female patients and urban population were significantly more knowledgeable about antibiotics compared to male and rural population .Also patients who had a healthcare worker among in the family, those who were infected with COVID-19 or have received flu/COVID-19 vaccines were significantly more knowledgeable about antibiotics .Whereas, patients with better antibiotic knowledge, were less frequently admitted to hospital, less used of antibiotic therapy, less used of immunosuppressant drugs and less needed for medical devises employment.

Conclusion: Our study revealed that the participants had poor knowledge, malpractice and neutral attitude toward antibiotic use and resistance. Also, the attitude and practice were directly related to participant knowledge and to several patient's factors.

Keywords: Knowledge, Attitude, Practice, Antibacterial, Antimicrobial resistance.

INTRODUCTION

Poor people's knowledge, attitude , and practice (KAP) are the most imperative factors leading to misuse of antibiotics globally and contributing to emergence of antimicrobial resistance(AMR)(1). Antimicrobial resistance produces a progressively grave risk for global public health in the previous two decades and has been evaluated as the main health endangerment in the last century(2). In USA, an established report from the Center of Disease Control (CDC) displayed that the burden of antibiotic resistance is still significant , with approximately three million antibiotic-resistant infections with no less than 23 000 related deaths annually(3). While in Europe, the burden of infections due to antibiotic-resistant bacteria is comparable to the combined burden that of influenza, tuberculosis and HIV/AIDS. Each year, Europe records 670,000 new resistant infections and 33,000 deaths as a result of these infections(4). In spite of variation in circumstances of antimicrobial resistance in the different countries , it is clear that an epicenter of antimicrobial resistance is Asia (5) . AMR impact is not surprisingly great in low- and middle-income countries (LMICs) of the Middle East which bear the highest-burden of AMR and as a result their people suffer the most from this problem (6) . the finding of certain systemic review revealed that rate of bacterial infection acquired in hospital setting of Middle East countries three time higher than that in USA. As a result both the requirement for antibiotics and the burden of resistance are likely to increase in these countries. This is in turn has tremendous impression on the health

outcomes of the populations by increase the morbidity, mortality and disability(7,8). Besides the uncritical utilization of antibiotics which ,partly, due to the lack of knowledge about proper use of antibiotics in these populations .A review study found that in excess of one-third of low and middle income populations had a lack of information about antimicrobial drugs and their action (9). also there is a clear deficiency of reliable research and surveillance programs about AMR(10). As the database of clinical trials library stated that despite there are 268 ongoing studies about AMR ,only 16 of these studies conducted in Middle East and no study from Iraq till the current study (11).Therefore our study aimed to collect data reflecting the state of knowledge, attitude and use of antibiotics within the Iraqi community and exploring the patient's predictive factors associated with it.

PATIENTS AND METHODS

Study design and setting

A cross-sectional observational study conducted on patients presented to microbiological lab of AL- ALSadar medical city and AL-Zahraa teaching hospital / Najaf governate/ Iraq during the period of October 2021 to February 2022.

Study population

The participants included patients presented with different kinds of infections and requested for culture /sensitivity test for organisms isolated from different sources such as blood, urine, stool and other sources. The total sample size were 475 patients

Tools

The data collected by validated pre-tested self-administered questionnaire (face to face interview). The questionnaire content was consisted contained 36 questions divided into 5 sections. The first section (6 items) involved gathered data about sociodemographic characteristics of the participants including (age, gender, ,area of residence ,education level , presence of person with medical profession in family , monthly income. The second section (eight items) involved the risk factors or patient's clinical information such as previous infection or hospitalization due to covid 19 ,vaccination with influenza and or corona vaccine, last three months hospital admission, last three months antibiotic use, current use of immunosuppressants and steroids drugs ,current use of medical devices , comorbidities, smoking. The third section was knowledge section (eight questions) evaluated patients knowledge about type of infections treated by antibiotics and types of antibiotics , if the antibiotic effect on flu and diarrhea, if the antibiotic always effective for the same infection ,emergence of antibiotic resistance due to excessive antibiotic use ,spread of antibiotic resistance , effect of antibiotics on patients normal flora. The forth section was attitude section (five questions) involved participants attitude towards antibiotics such as the participant immunity to fight infections, self-medication ,preference of injections over oral antibiotics , the safety of antibiotics. The fifth section (six questions) gathered data to assess the participant practices towards rational use of antibiotics including the use of left-over antibiotics , poor compliance with medical courses , sharing antibiotics with family members , preference of pharmacist advice over physician prescription and self-medication.

Data analysis

The questionnaire has included 8 questions related to knowledge , 5 questions about attitude and 6 questions about practice. The first two questions in knowledge section were with multiple choices answers and the correct answer was given a score of 1 while the incorrect answer was given a score of 0 .The rest 6 questions about knowledge had choices for response include (yes, no ,don't know) and one mark was given for correct answer . whereas incorrect or don't know responses were given no mark or 0 .The total knowledge score for each participant was calculated by summation the number of the correct answers from all statements so the maximum possible score in the knowledge section was 8 . A five -points likert scale (strongly agree, agree , neutral ,disagree ,strongly disagree) ranging from 1 to 5 was used for scoring of practice and attitude sections .The score 1 was given for least suitable answer and the score 5 was given for the most suitable response(12) .The lowest possible score was 5 and the highest possible score was 25 for attitude. While the lowest score for practice section was 6 and the highest score was 30 .

Ethical consideration: This study was approved by the Ethics and Scientific Committee University of Kufa/college of pharmacy with reference number (469), as well as by the Scientific Committee of Researches of Al-Najaf Health Department with approval number (46202). Our study registered at Clinical Trials.gov with the registration number (NCT05100407).

Statistical analysis :

The results were analyzed by using Statistical Package for Social Sciences (SPSS) version 25. The descriptive analyses expressed by (means, ,frequencies, standard deviation and percentages) were conducted for all items of study . . Chi-Square Test/Exact Fisher test was used to measure the difference between two categorical variables. Pearson correlation was used to measure the relationships among knowledge, attitude and practice (KAP) of antibiotics. One-way analysis of variance

(ANOVA) Test was used to measure the difference in the patients' KAP according to the education and income levels. Independent T-test was used to measure the difference in the patients' KAP according to several characteristics of patients. P-value of less than 0.05 was deemed significant statistically.

RESULTS

The study included 475 patients. The majority (60%) were female. Their age ranged from 12 years to 72 years with an average of 18.2 (± 17.2) years. The vast majority of patients (81.1%) lived in urban areas. The majority of patients (64.4%) had primary or secondary school degrees. More than half (56.2%) had low income and only 4.8% with high income. (Table 1).

Table 1: The characteristics of the participating patients

Character	**Subcategories**	**N**	**%**
Age categories	12-18 years	55	11.6
	18-30 years	222	46.8
	30-40 years	104	21.8
	40-50 years	41	8.7
	50-60 years	36	7.5
	Above 60 years	17	3.6
	Total	475	100.0
Gender	Women	282	60
	Men	188	40
	Total	470	100
Residence area	Rural /Urban	90/385	18.9/81.1
	Total	475	100.0
Education level	Without school education	76	15.9
	Primary or secondary school	307	64.7
	Bachelors and above	92	19.4
	Total	475	100.0
Monthly income (in IQD[a]/month)	First (less than 500000)IQD	267	56.2
	Second(500000-1000000)IQD	185	38.9
	Third (more than 1500000)IQD	23	4.8
Smoking status	Non Smoker	203	80.6
	Smoker	49	19.4
	Total	252	100.0

Health care provider among family	Non-medical	394	82.9
	Medical	81	17.1
	Total	475	100.0

a IQD: Iraqi Dinar

Table 2: Patients risk factors

Risk Factors	**Subcategories**	**N**	**%**
Having comorbidities	Yes	130	27.4
Having hypertension disease	Yes	40	8.5
Having diabetes mellitus disease	Yes	25	5.3
Having chronic kidney injury (CKI)	Yes	23	4.8
Having asthma/COPD	Yes	19	4.0
Having cancer	Yes	7	1.5
Having any chronic illness	Yes	54	11.4
Recent hospitalisation in the last 3 months	Yes	205	43.2
Application of medical devices such as urinary catheters, or gastrointestinal	Yes	56	11.8
Antibiotics consumption in the last three months	Yes	409	86.1
Consumption of immunosuppressant medication or corticosteroids	Yes	56	11.8
Been infested or hospitalized with Corona virus	Yes	118	24.8
Taken Corona or Influenza vaccine(s)	Yes	65	13.7

Patients Total score of knowledge, Attitude and Practice.

In general, the participants had below average knowledge score (3.3 1.6 out of 8.0 points) which represent 42% as total knowledge Score percentage. Also, the percentage of total practice score was lower than average 42% (16.03 out of 30 points. On the other hand, they had above average attitude score (56%) (Table 3).

Table 3: The descriptive of patient knowledge, attitude and practice scores.

	N	Minimum	Maximum	Mean	Std. Deviation
Total Knowledge score	475	0	8	3.33	1.62
Total Knowledge Score as %	475	0	100	42	20

Total attitude score	475	7	25	16.27	3.35
Total Attitude Score as %	475	10	100	56	17
Total Practice score	475	6	30	16.03	5.05
Total Practice Score as %	475	00	100	42	21

The association between the score of knowledge, attitude and Practice with patients' variables

Female patients and those who lived in urban areas (cities) were significantly (P-value < 0.05) more knowledgeable about antibiotics compared to male and those lived in rural areas, respectively. Patients who had a healthcare worker among in the family, those who were infected with COVID-19 or have received flu/COVID-19 vaccines were significantly (P-value < 0.05) more knowledgeable about antibiotics. On the other hand, patients with better antibiotic knowledge, were significant less frequently admitted to hospital, less used of antibiotic therapy, less used of immunosuppressant medications and less needed to use medical devises inside their bodies (Table 4).

Regarding to the attitude toward antibiotics, only gender had significant effect. Female patients had significantly higher antibiotic attitude scores compared to their counterpart male (Table 5).

Four patient characteristics had significant (P-value < 0.05) effect on the total scores of antibiotic practices: Residential area, availability of healthcare provide in the family, being admitted to hospital recently, and used antibiotics recently (Table 4). Patients who lived in urban areas and had healthcare provider in the family had significantly higher total scores of antibiotic practices. In other words, they used antibiotics more wisely compared to patients who lived in rural areas and did not have healthcare worker in their families. On the other hand, patients with high antibiotic practice scores were significantly (P-value < 0.05) less frequently admitted to hospital and less used antibiotics recently (Table 6).

Table 4: Differences in antibiotic Knowledge according to patient characteristics

	Variables	N	Mean	Std. Deviation	P-value
Gender	Women	282	**3.52**	1.66	.001*
	Men	188	3.04	1.51	
Area of residence					
	Rural	90	2.77	1.37	.0001*
	Urban	385	**3.47**	1.64	
Smoking	Non smoker	203	3.70	1.60	.219
	Smoker	49	3.39	1.67	
Is there any healthcare provider among your family members?	Non-medical	394	3.17	1.52	.0001*
	Medical	81	**4.14**	1.82	
Had been admitted to hospital in last three months	No	270	**3.64**	1.57	.0001*
	Yes	205	2.94	1.59	
Using medical devices such as urinary catheters, or gastrointestinal tubes	No	419	**3.41**	1.61	.004*
	Yes	56	2.75	1.552	
Have used antibiotics in the last three months	No	66	**3.82**	1.54	.009*
	Yes	409	3.26	1.62	
Do you use immunosuppressant medication or corticosteroids?	No	419	**3.39**	1.58	.029*
	Yes	56	2.89	1.79	
Have you ever been infected and/or hospitalized with COVID-19?	No	357	3.29	1.63	.309
	Yes	118	**3.47**	1.57	
Have you received influenza or COVID-19 vaccine?	No	410	3.27	1.57	.019*
	Yes	65	**3.77**	1.81	
Comorbidities	No	88	**3.48**	1.609	0.931
	Yes	215	**3.47**	1.688	

Table 5: Differences in attitude about antibiotics according to patient characteristics

	Variables	N	Mean	Std. Deviation	P-value
Gender	Women	282	**16.64**	3.45	.004*
	Men	188	15.73	3.13	
Area of residence	Rural	90	16.06	3.33	.505
	urban	385	16.32	3.35	
Smoking	Non-smoker	203	16.09	3.433	.231
	Smoker	49	15.45	3.096	
Is there any healthcare provider among your family members?	Non-medical	394	16.28	3.379	.903
	Medical	81	16.23	3.151	
Have you received influenza or COVID-19 vaccine?	No	410	16.27	3.35	.980
	Yes,	65	16.28	3.32	
Been infected and/or hospitalized with COVID-19?	No	357	16.36	3.39	.273
	Yes	118	15.97	3.21	
Do you use immunosuppressant medication or corticosteroids?	No	419	16.29	3.37	.672
	Yes	56	16.09	3.19	
Have you used antibiotics in the last three months?	No	66	16.68	3.39	.278
	Yes	409	16.20	3.34	
Are you using medical devices such as urinary catheters, or gastrointestinal tubes?	No	419	16.31	3.31	.420
	Yes	56	15.93	3.62	
Had you been admitted to hospital in last three months?	No	270	16.42	3.29	.259
	Yes	205	16.07	3.42	
Comorbidities	No	215	16.07	3.302	0.788
	Yes	88	15.95	3.129	

*Significant (P-value < 0.05) according to Independent T-test.

Table 6: Differences in Practice about antibiotics according to patient characteristics

	Variables	N	Mean	Std. Deviation	P-value
Gender	Women	282	16.38	5.35	.055
	Men	188	15.49	4.55	
Area of residence	Rural	90	14.80	4.93	.010*
	Urban	385	**16.31**	5.05	
Smoking	Non-smoker	203	16.69	5.319	.586
	Smoker	49	16.24	4.240	
Is there any healthcare provider among your family members?	Non-medical	394	15.76	4.968	.010*
	Medical	81	**17.35**	5.282	
Had been admitted to hospital in last three months	No	270	**16.65**	5.12	.002*
	Yes	205	15.21	4.85	
Using medical devices such as urinary catheters, or gastrointestinal tubes	No	419	16.19	5.01	.050
	Yes	56	14.79	5.23	
Have used antibiotics in the last three months	No	66	**18.18**	4.81	.000*
	Yes	409	15.68	5.01	
Use immunosuppressant medication or corticosteroids	No	419	16.11	5.09	.346
	Yes	56	15.43	5.02	
Have been infected and/or hospitalized with COVID-19	No	357	15.87	5.07	.233
	Yes	118	16.51	5.01	
Have received influenza or COVID-19 vaccine	No	410	15.89	5.08	.145
	Yes	65	16.88	4.84	
Comorbidities	No	215	15.70	5.303	
	Yes	88	16.48	4.787	0.233

According to the ANOVA test, the patient education level had significant (P-value < 0.05) effect on the total scores of the

knowledge and practice of antibiotics (Table 7 A). More specifically and according to the post-hoc (Dunnett T3) analysis, patients with university/post-graduate degrees had significantly higher total scores of knowledges and practice of antibiotic use compared to patients without formal education and those with primary/secondary school degrees (Table 7 B).

Table 7A: Difference in knowledge, attitude and practice according to the patient education level

		Sum of Squares	df	Mean Square	P-value.
Total Knowledge score	Between Groups	42.717	2	21.358	.000*
	Within Groups	475.380	193	2.463	
	Total	518.097	195		
Total attitude score	Between Groups	61.928	2	30.964	.057
	Within Groups	2060.623	193	10.677	
	Total	2122.551	195		
Total Practice score	Between Groups	226.494	2	113.247	.011*
	Within Groups	4766.092	193	24.695	
	Total	4992.587	195		

*Significant (P-value < 0.05) according to ANOVA

Table 7B: Multiple Comparisons: Dunnett T3 (education vs Knowledge, practice)

Dependent Variable	(I) Education	(J) Education	Mean Difference (I-J)	P-value
Total Knowledge score	.00	1.00	.122	.968
		2.00	-1.090*	.019*
	1.00	.00	-.122	.968
		2.00	-1.212*	.001*
	2.00	.00	1.090*	.019*
		1.00	1.212*	.001*
Total Practice score	.00	1.00	.876	.707
		2.00	-1.926	.291
	1.00	.00	-.876	.707
		2.00	-2.802*	.019*
	2.00	.00	1.926	.291
		1.00	2.802*	.019*

*Significant (P-value < 0.05) according Dunnett T3 test, 0=Without formal education

1=Primary or secondary education, 2=College/postgraduation education, Children less than 12 years old were excluded

According to the ANOVA test, the patient/parent income level had significant (P-value < 0.05) effect on the total scores of the knowledge and attitude about antibiotics (Table 8A). More specifically and according to the post-hoc analysis, patients/parents with high income had significantly higher total scores of knowledges and attitude compared to those with middle income. Additionally, middle income participants had significant higher total antibiotic knowledge/ attitude scores compared to low-income patients/parents (Table 8B).

Table 8A: Difference in knowledge, attitude and practice according to the patient income

		Sum of Squares	Mean Square	P-value
Total Knowledge score	Between Groups	77.254	38.627	.000*
	Within Groups	1158.523	2.454	
	Total	1235.777		
Total attitude	Between Groups	112.998	56.499	.006*
	Within Groups	5190.046	10.996	
	Total	5303.044		
Total Practice	Between Groups	149.081	74.540	.054

	Within Groups	11953.564	25.325	
	Total	12102.644		

Table 8 B: Post Hoc Tests: Multiple Comparisons: Dunnett T3

Dependent Variable	(I) Monthly income	(J) Monthly income	Mean Difference (I-J)	P-value
Total Knowledge score	Low	Middle	-.610*	.000*
		High	-1.543*	.002*
	Middle	Low	.610*	.000*
		High	-.933	.089
	High	Low	1.543*	.002*
		Middle	.933	.089
Total attitude score	Low	Middle	-.683	.094
		High	-1.963*	.013*
	Middle	Low	.683	.094
		High	-1.280	.160
	High	Low	1.963*	.013*
		Middle	1.280	.160

Correlation among the knowledge, practice and attitude score

There were significant positive correlations among KAP (knowledge, attitude and practice) of antibiotics (Table 9). In other words, there were significant (P-value < 0.05) positive correlations between the total scores of patients' knowledge and attitude, between knowledge and practice and between attitude and practice.

Table 9: The correlations among KAP (knowledge, attitude and practice) of antibiotics

		Total Knowledge	Total attitude
Total Knowledge	Pearson Correlation		.122
	P-value		.008*
	N		475
Total attitude	Pearson Correlation	.122	
	P-value	.008*	
	N	475	
Total Practice	Pearson Correlation	.225	.455
	P-value	.0001*	.0001*
	N	475	475

DISCUSSION

Overall knowledge attitude and practice (kap) of participants

The main findings of the present study showed poor knowledge of participants regarding antibiotic use and resistance as evident by below average total knowledge percentage (42%) .The malpractice toward antibiotic use was also demonstrated by (42%) as percentage of total score. On other hand, overall individuals had borderline attitude (56%). A comparable pattern of results was reported by a cross sectional study done in Baghdad- Iraq revealed that there were many gaps in knowledge about antibiotics in which one third of them have inadequate knowledge level with <50%. Additionally, the attitude of participants toward antibiotics also contained shortcomings revealed by more than half of sample of the study was considered to have a negative attitude (13). In Jordan a pilot study estimated that the percentage of participants who answered knowledge questions correctly was below average (47.3%) (14). Awad et al. also recorded that (46.6%) of the participants had poor knowledge score , while(41.2%) of the participants in the this study had poor attitude score(15). The results of another studies conducted in Iran and Jordan showed that the majority of the participants possessed inadequate knowledge and practice about antibiotics consumption similar to our results in addition to their misconception about antibiotic usage(16,17) .

The association between the score of knowledge, attitude and Practice with patients' variables : The core finding about knowledge that there are ten patient characteristics had significant effect on the total knowledge score about antibiotics: Gender,

residential area, availability of healthcare worker in the family, being admitted to hospital recently, using a medical devise inside the body, used antibiotics recently, using immunosuppressant medication(s), and received flu or COVID-19 vaccine(s), income and education level of participants .For instance, Female patients and those who lived in urban areas (cities) were significantly more knowledgeable about antibiotics compared to male and those lived in rural areas. The gender finding was in line with previous studies from Syria , Malaysia and Gana (18–20).The possible explanation for female having more awareness than men is they were commonly more open to alter in perceptions about antibiotic usage than men besides the development in telecommunications over the past little years and increase the social media platforms that published videos about the proper use of antibiotics and antibiotic resistance regularly(21) .Another explanation for female being more knowledgeable than male is that in most developing countries , females hold the accountability of taking care of their children and the other family members (22). In contrast to our study, survey in Bangladesh found that males were more knowledgeable than females (23). Furthermore, those who live in urban areas have a tendency to be more knowledgeable owing to having well access to information and better contact to public health-awareness programs (12).Whereas Jimah et al (20) found no association between place of residence and overall knowledge in contrary to our study. Also the association of advanced knowledge level with the presence of medical person between family members in our study run in agreement with Napolitano et al. finding(24). Another factor associated with knowledge score significantly is being infected with COVID-19 or have received flu/COVID-19 vaccines and the reason behind this significancy might be due to the rates of antibiotic use in patients with COVID-19 is (37–100%)(25). That mean most of people infected with covid-19 have information about antibiotics. On the other hand, our study pointed out that patients with better antibiotic knowledge, often less used of antibiotic therapy, less admitted to hospital, less used of immunosuppressant medications and less needed to use medical devises inside their bodies. As the knowledge plays an important role in shaping beliefs and behaviors so inadequate knowledge about drugs increases the overuse or misuse of drugs and vice versa. In conclusion the misuse of drugs lead to deterioration of medical condition , hospital admission and even use the medical devices. The patient income level had significant effect on the total scores of the knowledge and attitude about antibiotics. More specifically patients with high income had significantly higher total scores of knowledges and attitude compared to those with middle and low income. Several studies were in agreement with our study such as those conducted in Malaysia ,Lebanon and KSA(19,26,27) .Also in association with attitude , the female gender in the present study identified as a significant predictor of appropriate behavior or attitude . A previous study in KSA demonstrated the same result(27).While another survey from Lebanon noted that There was no significance between attitude and gender (26). The high scores of the knowledge and practice of antibiotics significantly associated with high education level . More precisely patients with university/post-graduate degrees had higher total scores of knowledges and practice than those without formal education and those with primary/secondary school degrees. Lack of knowledge and practice among people with lower education has been described already in previous studies conducted in several countries (24,28,29).On the other hand, two surveys from Jordan and Lebanon found no association between education and or knowledge and practice(17,30). This current finding suggested that it is essential to strengthen the education of antibiotics among less educated population. Additionally patients who lived in urban areas and had healthcare provider in the family had significantly higher total scores of antibiotic practices. These findings align with previous studies conducted in Korea and Nepal(22,28). On the other hand, hospital admission and antibiotics use significantly associated with antibiotic practice scores that mean patients with high antibiotic practice scores were use the antibiotics wisely lead to less frequently admitted to hospital and less used antibiotics lately.

Correlation between KAP: The current study found that Respondents' adequate knowledge of antibiotics is correlate directly with attitude and practice towards the use of antibiotics. This finding suggested that the participants' appropriate knowledge towards antibiotics identified to be a predictor for positive attitude towards antibiotic use . Diverse studies confirmed our finding and conducted in Sweden , Lebanon and KSA)(26,27,31).Similarly Alnasser et al. (27) had shown the maximum positive correlation between the attitude and practice towards the use of antibiotics .The attitude-practice correlation appeared clearly in our study as (65.4%) of the participants usually use the left-over antibiotics and only (28.2%) of them believing in body immunity to fight infection without antibiotics so this submits a slack mentality in starting antibiotics and does not allow enough time for the body natural defense systems to act and this is largely consistent with the finding of cross sectional study in Lebanon (26).Also the significant correlation between knowledge and practice quitely demonstrated between statements of using antibiotics for cold and flu symptoms and stopping antibiotics use as symptoms improve and this indicates that the knowledge gap may not be random as the faulty beliefs will lead to indiscriminate use of antibiotics.

CONCLUSION

Our study revealed that the participants had poor knowledge, malpractice and neutral attitude toward antibiotic use and resistance. Also, the attitude and practice were directly related to participant knowledge thus increasing awareness and knowledge will ensure positive attitude and reduce antibiotic malpractice. Many predictive factors were affecting the overall knowledge and practice toward antibiotics such as gender, residential area, availability of healthcare worker in the family,

income and education level of participants. As well the study showed that patients with better knowledge and practice of antibiotics often less used the antibiotics, less frequently admitted to hospital, less used of immunosuppressant medications and less needed to use medical devises inside their bodies.

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