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Assessment Of Knowledge And Attitudes On Antibiotic Use And It Is Resistance Among Students Of The Technical Institute Of Babylon, Iraq

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Abstract

Background: Antimicrobial resistance is a significant public health issue that affects the entire world. The World Health Organization has highlighted improper antibiotic usage as a key risk factor for antimicrobial resistance.

Methodology: This study is a descriptive cross-sectional study was conducted on 316 students in Babylon Technical Institute. The total number of participants in this study was 316 students randomly selected from Babylon Technical Institute". by simple random sampling technique. The data were collected by a direct interview that was conducted by using a structured questionnaire.

Results: The current studydemonstrates that The highest percentage (49.4%) was in the age group (21-25) years and the lowest percentage (3.2%), was in the age group >=31 years. There was a distinct males preponderance 61.4%.It shows that there is a negative correlation (not statistically significant, P-value >0.01) between knowledge and attitudes (r= 0.040).

Conclusions: The study reveals that the total assessment score for both knowledge and attitudes were fair about antibiotic use.

Key words: Knowledge, Attitudes, Students, Antibiotic Use

Introduction:

Antimicrobials, long dubbed the "magic bullet," have now been rendered useless in the battle against bacterial infections due to antimicrobial resistance (AMR), which has arisen as a global public health issue. One of the main reasons contributing to the fast development of superbugs and subsequent treatment failures with higher death rates is the inappropriate and widespread use of such life-saving medicines [1]. Antibiotic resistance might result in a significant number of deaths worldwide unless

appropriate precautions are implemented [2].The developing countries is more at risk due to irrational antibiotic use, non-human antibiotic usage, a lack of awareness about AMR, hunger, ineffective surveillance, and low healthcare standards [3].

Antibiotic misuse and overuse has resulted in the emergence of antimicrobial resistance (AMR), which is a serious danger to individual health across the world [4]. Drug-resistant illnesses cause at least 700,000 fatalities globally each year, with the rate of mortality expected to rise to 10 million deaths per year by 2050 [5,6]. Antimicrobial resistance will be responsible for an estimated 4.73 million fatalities per year in Asia by 2050 [7].

According to World Health Organization standards, increasing healthcare practitioners' knowledge and prescription behaviors is one method to reduce excessive antibiotic usage [8]. Although physicians play an essential role in the selection and usage of medicine, patients' awareness is as critical [9].

Thus, ‘antibiotic abuse,' which refers to the illogical or excessive use of antibiotics, may endanger any patient of any age group and could affect any antibiotic [10,11,12]. It is now considered a significant public health problem worldwide, with a special focus on poorer nations, as it is rapidly contributing to antibiotic resistance [13]. Self-medication with antibiotics, which is regarded a significant cause of antibiotic abuse, is extremely common in the latter nations, where knowledge and laws are often lacking [14].

Aims of the study:

1- To assess knowledge and attitudes on antibiotic use and it is resistance among students of the technical institute of Babylon.
2- To finds an association between socio-demographic variables and total knowledge and attitudes level.

Methodology:

Study design and **period of Study**: This study is a descriptive cross-sectional study conducted on 316 students in Babylon Technical Institute.Data were collected during the period starting (The first of May 2021- The second of August 2021).

Sampling Technique: Thetotal number of participants in this study was 316 students randomly selected from Babylon Technical Institute” by simple random sampling technique.the data were collected by a direct interview that was conducted by using a structured questionnaire, each interview lasts for 15-20 minutes.

Scoring Criteria: The scale of the two levels was rated on the 3 points (Likert respondent scale) it was scored as scoring of agreed about by assigning a score of (1) for yes or agree, (2) for (Do not know or neutral), and (3) for (No or Disagree) in case of negative phrases, and assigning a score of (3) for yes or agree, (2) for (Do not know or neutral), and (1) for (No or Disagree) in case of positive phrases. Mean of Score (<2) Poor, (2-2.5) Fair, and (>2.5) Good.

Statistical analysis:

Analysis of data was carried out using the available statistical package of SPSS-25 (Statistical Packages for Social Sciences- version 25). Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values). One-Way analysis of variance (ANOVA) was utilized to reveal significant differences between socio-demographic variables (Age groups, Monthly income, and Educational level of father and mother) and total knowledge and attitudes scores. The Independent Sample t-test was used to reveal significant differences between socio-demographic variables (gender, marital status, residence, and educational stage) and total knowledge and attitudes score.

Results:

Table 1 shows that The highest percentage (49.4%) was in the age group (21-25) years and the lowest percentage (3.2%), was in the age group >=31 years. There was a distinct males preponderance 61.4%.Regarding marital status the highest percentage (84.2%) was single. while regarding the residence the majority of the studied sample (63.9%) are from urban area. The current study demonstrates that the highest percentage (75.3%) of the students have medium monthly income assessment, while 75.3% of the studied samples were in the first educational stage. As for the education level of father and mother, the study found that the highest percentage (24.1%) of the studied samples reported their father's graduate' from the institute, while 30.4% of the students reported their mother's graduates from primary and secondary school.

Table (1): The Distribution of Studied Sample According to Socio-demographic data

Socio-demographic data		Frequency	Percent
Age groups	<=20 Years	106	33.5
	21-25 Years	156	49.4
	26-30 Years	44	13.9
	>=31 Years	10	3.2
	Mean± SD (Range)	22.47±3.33 (18-35)	
Gender	Male	194	61.4

	Female	122	38.6
Marital status	Single	266	84.2
	Married	50	15.8
Residence	Urban	202	63.9
	Rural	114	36.1
Monthly income assessment	Low	76	24.1
	Medium	238	75.3
	High	2	0.6
Educational Stage	First stage	238	75.3
	Second stage	78	24.7
Education level of father	Illiterate	32	10.1
	Primary	70	22.2
	Secondary	74	23.4
	Institute	76	24.1
	College and higher	64	20.3
Education level of mother	Illiterate	60	19.0
	Primary	96	30.4
	Secondary	96	30.4
	Institute	36	11.4
	College and higher	28	8.9

Figure1 represents the distribution of the studied sample according to information sources, the study found that the highest percentage (62.7%) of the students get their information from internet, while the lowest percentage (1.9%) were get their information from specialist doctor.

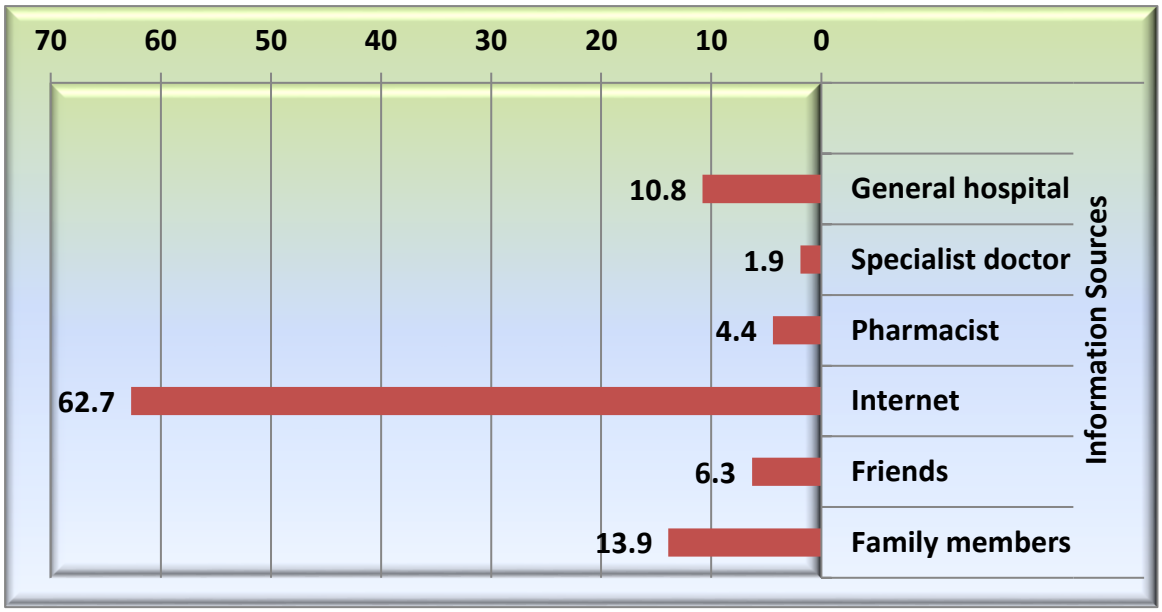

Figure (1) : The Distribution of studied sample according to information sources

Table 2 shows that majority of the students have a good assessment score regarding their knowledge about (Many infections are becoming increasingly resistant to antibiotic treatment), and (Overuse of antibiotics increases the risk of antibiotic resistance.). While most of the studied samples have a poor assessment level regarding questions (antibiotics are effective in viral infections, and Do you think that using antibiotics will speed up recovery from cold, cough, and other diseases). As for other questions, the study found that all questions have a fair assessment level, which rested within the mean score (range from 1.43 to 2.70)**.** While total knowledge assessment of the studied samples was fair level with weighted Mean (2.23±0.42).

Table (2): Distribution of Studied Sample According to Their Knowledge about Antibiotic Use.

Knowledge		No.	%	MS	SD	Assessment
Have you heard of bacterial resistance? (Yes)	Yes	196	62.0	2.38	0.84	**Fair**
	No	74	23.4			
	Do not know	46	14.6			
Antibiotics have no side effects (No)	Yes	34	10.8	2.49	0.68	**Fair**
	No	190	60.1			
	Do not know	92	29.1			
We will have fewer antibiotics to use in the future if we don't use antibiotics properly.	Yes	168	53.2	2.37	0.73	**Fair**
	No	48	15.2			

(Yes)	Do not know	100	31.6			
Antibiotics may cause allergic reactions that can lead to death. (Yes)	Yes	164	51.9	2.36	0.74	**Fair**
	No	50	15.8			
	Do not know	102	32.3			
Antibiotics are effective in viral infections. (No)	Yes	194	61.4	1.51	0.71	**Poor**
	No	42	13.3			
	Do not know	80	25.3			
Many infections are becoming increasingly resistant to antibiotic treatment. (Yes)	Yes	240	75.9	2.70	0.56	**Good**
	No	18	5.7			
	Do not know	58	18.4			
If bacteria are resistant to antibiotics, it may be very difficult or impossible to treat the infections they cause. (Yes)	Yes	172	54.4	2.35	0.78	**Fair**
	No	60	19.0			
	Do not know	84	26.6			
Overuse of antibiotics increases the risk of antibiotic resistance. (Yes)	Yes	220	69.6	2.63	0.60	**Good**
	No	20	6.3			
	Do not know	76	24.1			
Do you think that using antibiotics will speed up recovery from cold, cough, and other diseases. (No)	Yes	226	71.5	1.43	0.74	**Poor**
	No	48	15.2			
	Do not know	42	13.3			
Antibiotics can be obtained without the intervention of a doctor in pharmacies. (No)	Yes	134	42.4	2.0	0.92	**Fair**
	No	136	43.0			
	Do not know	46	14.6			
Do you think that repeated use of antibiotics will reduce treatment when using the antibiotic again. (Yes)	Yes	186	58.9	2.38	0.80	**Fair**
	No	64	20.3			
	Do not	66	20.9			

	know					
Weighted Mean± SD	**2.23±0.42**					**Fair**

Poor (mean less than 2), Fair (mean 2-2.5) Good (mean more than 2.5).

Table 3 shows that majority of the students have a good assessment score regarding their attitudes about (Determining drug susceptibility testing for bacteria before using antibiotics), and (Do you agree that antibiotics help get better faster?). While most of the studied samples have a poor assessment level regarding questions (Would you agree to take an antibiotic when you have a cough?), (In case of a missed dose, do you take it with your next dose?), and (Do you agree to use antibiotics to reduce complications of corona disease?). As for other questions, the study found that all questions have a fair assessment level, which rested within the mean score (range from 1.34 to 2.65)**.** While total attitudes assessment of the studied samples was fair level with weighted Mean (2.17±0.43).

Table (3): Distribution of Studied Sample According to Their Attitudes about Antibiotic Use.

Attitudes		No.	%	MS	SD	Assessment
Determining drug susceptibility testing for bacteria before using antibiotics. (Agree)	Agree	226	71.5	2.65	0.58	**Good**
	Disagree	18	5.7			
	Neutral	72	22.8			
Antibiotic resistance is a problem in Iraq. (Agree)	Agree	178	56.3	2.46	0.67	**Fair**
	Disagree	32	10.1			
	Neutral	106	33.5			
Use antibiotics that have been given to a friend or family member for as long as they are used to treat the same disease. (Disagree)	Agree	96	30.4	2.23	0.88	**Fair**
	Disagree	170	53.8			
	Neutral	50	15.8			
Buying the same antibiotics or ordering them from a doctor if you are sick and helping you get better when you had the same symptoms before. (Disagree)	Agree	98	31.0	2.15	0.86	**Fair**
	Disagree	148	46.8			
	Neutral	70	22.2			
Getting an antibiotic from a pharmacy without a prescription. (Disagree)	Agree	78	24.7	2.32	0.84	**Fair**
	Disagree	182	57.6			
	Neutral	56	17.7			
Do you agree that antibiotics prevent serious diseases? (Agree)	Agree	182	57.6	2.38	0.78	**Fair**
	Disagree	60	19.0			

	Neutral	74	23.4			
Do you agree that antibiotics help get better faster? (Agree)	Agree	224	70.9	2.65	0.58	**Good**
	Disagree	18	5.7			
	Neutral	74	23.4			
Would you agree to take an antibiotic when you have a cough? (Disagree)	Agree	224	70.9	1.34	0.58	**Poor**
	Disagree	18	5.7			
	Neutral	74	23.4			
In case of a missed dose, do you take it with your next dose? (Disagree)	Agree	112	35.4	1.96	0.82	**Poor**
	Disagree	102	32.3			
	Neutral	102	32.3			
Do you agree to use antibiotics to reduce complications of corona disease? (Agree)	Agree	62	19.6	1.61	0.79	**Poor**
	Disagree	184	58.2			
	Neutral	70	22.2			
Weighted Mean± SD		**2.17±0.43**				**Fair**

Poor (mean less than 2), Fair (mean 2-2.5) Good (mean more than 2.5).

Table 4 represents the Independent Samples Test of students' knowledge about antibiotic use according to gender, marital status, residence, and educational stage. The study shows that No significant difference for all variables, and total knowledge levels except having Educational Stage the association was found to be had significant difference (p=0.011)**.**

Table (4): Independent Samples Test of students' knowledge about antibiotic use according to gender, marital status, residence, and educational stage

Independent Samples Test							
		N	**Mean**	**SD**	**T. test**	**Total df**	**P. value**
Gender	Male	194	2.231	0.274	-0.798	314	0.425
	Female	122	2.257	0.301			
Marital status	Single	266	2.239	0.277	-0.250	314	0.803
	Married	50	2.250	0.326			
Residence	Urban	202	2.238	0.292	-0.259	314	0.795
	Rural	114	2.247	0.273			
Educational	First stage	238	2.265	0.273	2.573	314	0.011

Stage	Second stage	78	2.170	0.309			

Significant difference at 0.05 level.

Table 5 represents One Way ANOVA of students' knowledge about antibiotic use according to Age groups, Monthly income, and Educational level of father and mother. The study shows that No significant difference for all variables, and total knowledge levels which P. value for Age groups, Monthly income, and Educational level of father and mother were (0.082, 0.221,0.957, and 0.629) respectively.

Table (5): One-Way ANOVA of students' knowledge about antibiotic use according to Age groups, Monthly income, and Educational level of father and mother

		N	Mean	SD	F	P. value
Age groups	≤20	106	2.277	0.288	2.259	0.082
	21-25	156	2.200	0.275		
	26-30	44	2.281	0.289		
	>31	10	2.327	0.329		
Monthly income assessment	Low	76	2.201	0.263	1.518	0.221
	Medium	238	2.252	0.291		
	High	2	2.454	0.000		
Educational level of father	Illiterate	32	2.250	0.278	0.162	0.957
	Primary	70	2.223	0.248		
	Secondary	74	2.235	0.293		
	Institute	76	2.244	0.318		
	College and higher	64	2.261	0.282		
Educational level of mother	Illiterate	60	2.218	0.257	0.647	0.629
	Primary	96	2.257	0.308		
	Secondary	96	2.250	0.258		
	Institute	36	2.186	0.362		
	College and higher	28	2.279	0.235		

Significant difference at 0.05 level.

Table 6 represents One Way ANOVA of students' knowledge about antibiotic use according to information sources. The study shows that No significant difference betweeninformation sources , and total knowledge levels which P. value (P=0.172)**.**

Table (6): One Way ANOVA of students' knowledge about antibiotic use according to information sources

information sources		N	Mean	SD	F	P. value
Where did you get information about the antibiotics	General hospital	34	2.310	0.243	1.556	0.172
	Specialist doctor	6	2.030	0.187		
	Pharmacist	14	2.350	0.268		
	Internet	198	2.228	0.294		
	Friends	20	2.245	0.295		
	Family members	44	2.239	0.275		

Significant difference at 0.05 level.

Table 7 represents the Independent Samples Test of students' attitudes about antibiotic use according to gender, marital status, residence, and educational stage. The study shows there a significant difference for all variables, and total attitudes level except having residence the association was found to be had no significant difference (p=0.074).

Table (7): Independent Samples Test of students' attitude about antibiotic use according to gender, marital status, residence, and educational stage

Independent Samples Test							
Gender	Male	**N**	**Mean**	**SD**	**T. test**	**Total df**	**P. value**
		194	2.200	0.217	2.058	314	0.040
	Female	122	2.150	0.188			
Marital status	Single	266	2.193	0.208	2.430	314	0.016
	Married	50	2.116	0.195			
Residence	Urban	202	2.165	0.194	-1.790-	314	0.074
	Rural	114	2.208	0.227			
Educational Stage	First stage	238	2.196	0.211	2.351	314	0.019
	Second stage	78	2.133	0.188			

Significant difference at 0.05 level.

Table 8 represents One Way ANOVA of students' attitudes about antibiotic use according to Age groups, Monthly income, and Educational level of father and mother. The study shows that No significant difference for all variables, and total attitudes level except having Monthly income assessment the association was found to be had no significant difference (P. value=0.004).

Table (8): One Way ANOVA of students' attitudes about antibiotic use according to Age groups, Monthly income, and Educational level of father and mother

		N	Mean	SD	F	P. value
Age groups	<=20	106	2.171	0.204	1.644	0.179
	21-25	156	2.198	0.213		
	26-30	44	2.168	0.203		
	>=31	10	2.060	0.142		
Monthly income assessment	Low	76	2.239	0.196	5.735	0.004*
	Medium	238	2.164	0.207		
	High	2	1.900	0.000		
Educational level of father	Illiterate	32	2.175	0.222	1.554	0.187
	Primary	70	2.228	0.167		
	Secondary	74	2.189	0.219		
	Institute	76	2.157	0.241		
	College and higher	64	2.150	0.176		
Educational level of mother	Illiterate	60	2.186	0.228	0.383	0.821
	Primary	96	2.189	0.184		
	Secondary	96	2.181	0.225		
	Institute	36	2.183	0.229		
	College and higher	28	2.135	0.141		

Table 9 represents One Way ANOVA of students' attitudes about antibiotic use according to information sources. The study shows there a significant difference betweeninformation sources , and total attitudes level which P. value (P=0.005)**.**

Table (9): One Way ANOVA of students' attitudes about antibiotic use according to information sources

information sources		N	Mean	SD	F	P. value
Where did you get information about the antibiotics	General hospital	34	2.188	0.208	3.444	0.005*
	Specialist doctor	6	2.300	0.154		
	Pharmacist	14	2.100	0.166		
	Internet	198	2.190	0.200		
	Friends	20	2.280	0.182		
	Family members	44	2.095	0.237		

Significant difference at 0.05 level.

Table 10 represents Pearson's correlation coefficients between students' knowledge and attitudes about antibiotic use. It shows that there is a negative correlation (not statistically significant, P-value >0.01) between knowledge and attitudes (r= 0.040).

Table (10): Pearson's correlation coefficients between students' knowledge and attitudes about antibiotic use

Pearson's correlation coefficients		Attitudes
Knowledge	Pearson Correlation	0.040
	Sig. (2-tailed)	0.482
	N	316

Pearson's correlation coefficients at 0.01 level.

Discussion:

The current study shows that the highest percentage (49.4%) was in the age group (21-25) years, Mean± SD (22.47±3.33) years. There was a distinct males of preponderance 61.4%. Regarding marital status the highest percentage (84.2%) was single. While regarding residence the majority of the studied sample (63.9%) are from urban areas. These results are agreed with the study findings done in Mali by Chen et al., (2021)[9], which found that the mean of ages were 21.3 ± 2.4 years, 69.5% of participants were males, the vast majority (90.6%) were single; (65.5%) of students live in urban areas and 34.5% students from rural areas. Also, these results are consistent withAljayyousiet al., (2019)[15], which found that 38.6% of the participants were in the age group (21–25) years.

This study found that the majority (69.6% and 62.0%) of the students have aware about overuse of antibiotics increases the risk of antibiotic resistance, and knowledgeable about antibiotic resistance respectively. This result agreed with Gili et al., (2014)[16], who revealed that 59.4% of the subjects were aware of antibiotic resistance, 73.1% of them know that misuse of antibiotics can lead to antibiotic resistance. Also, these findings agreed with another study done byShahpaweeet al., (2020)[17], which found that most of the students demonstrated good knowledge of antibiotics and antimicrobial resistance.A high percentage (60.1%, and 51.9%) of the studied samples knowledgeable regarding antibiotics have side effects, and antibiotics may cause allergic reactions that can lead to death, respectively. These results are consistent with the study findings conducted in Italy by Bert et al., (2017)[18], which found that 92.6% of the participants respond with agree about antibiotics can cause side effects, 94.77% of them reported agree about antibiotics can cause allergic reactions.

The majority of the students were incorrect answers about using antibiotics will speed up recovery from cold, cough, and other diseases, and antibiotics are effective in viral infections. These findings are consistent withAljayyousiet al., (2019)[15], which found that more than half of participants claimed that antibiotics are effective against viral infections, and 60% of the respondents reported that antibiotics speed up the recovery from most coughs and colds. Also, these results are consistent with Wang et al., (2019)[19], who revealed that 70.2% of the participants know about overuse of antibiotics increases the risk of antibiotic resistance. But, these results disagreed with Siam et al., (2021)[20], who revealed that 80% of the participants reported did not know regarding antibiotics make one recover faster when having a cold.

Regarding many infections that are becoming increasingly resistant to antibiotic treatment, the results found that 75.9% of the students know about it. This result agreed with Siam et al., (2021)[20] who revealed that 59.2% of the participants know about bacteria can become resistant to antibiotics.

In this study, more than half (54.4%) of the students know regarding (If bacteria are resistant to antibiotics, it may be very difficult or impossible to treat the infections they cause). This result is agreed with the study findings done in Bangladesh [17].

The present study shows that 53.8% of the students have a positive attitude regarding (Use antibiotics that have been given to a friend or family member for as long as they are used to treat the same disease). This result agreed withShahpaweeet al., (2020)[17], which found that 90.0% of the participants had a positive attitude about use antibiotics that have been given to a friend or family member for as long as they are used to treat the same disease.Regarding getting an antibiotic from a pharmacy without a prescription, the study shows that 57.6% of the students have a positive attitude

about it. This result is consistent with Siam etal., (2021) [20], which found that 63.7% of the participants have a positive attitude about taking an antibiotic prescription from a doctor.

The highest percentage (46.8%) of the students have a positive attitude regarding (Buying the same antibiotics or ordering them from a doctor if you are sick and helping you get better when you had the same symptoms before). The result agreed with the study findings done at University Brunei Darussalam [17].

Finally, the study reveals that knowledge and attitudes have a fair level. This result agreed with the study findings conducted in Sudan [21]. But, these results disagreed with Wang et al., (2016)[22], who revealed that Knowledge of antibiotics and their appropriate use was poor.

Conclusions:

1- The study reveals thattotal assessment score for both knowledge and attitudes were fair about antibiotic use.
2- More than half the students have a negative attitudes toward use antibiotics to reduce complications of corona virus disease.
3- There is a negative correlation (not statistically significant, P-value >0.01) between knowledge and attitudes.

Recommendations:

Further medical education among students on the appropriate use of antibiotics to correct misunderstandings and avoid the spread of antimicrobial resistance. One of the responsibilities of specialist doctors and pharmacists is to do this task.

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