

## Assessment of Knowledge, Attitude and Practice Regarding Antibiotics Misuse among the Public in Saudi Arabia

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### ABSTRACT

**Background:** The misuse of antibiotics could result in a public health problem including the high prevalence of antibiotic resistance.

**Objectives:** Assessing the knowledge, attitude and practice (KAP) regarding the antibiotics misuse in Kingdom of Saudi Arabia (KSA).

**Methods:** A cross-sectional questionnaire based study was conducted at AL-Mahd General Hospital, Saudi Arabia, Ministry of Health, from February to June 2017 among 721 adult Saudi subjects.

**Results:** The most common source of knowledge about antibiotics among participants was a physician (50.8%) followed by internet in 25.9%. About 50.3% of subjects used antibiotics more than 5 times per year and 65.6% of participants have recently used antibiotics. Insufficient knowledge was found among 59.6% of respondents and most of the subjects declared negative attitude and poor practice pattern. The good knowledge was associated with being young, female and higher educational degree.

**Conclusion:** The level of knowledge was insufficient and resulted in inappropriate attitude and practice pattern in KSA. The lower educational degree, young age and female gender were significant contributors to sufficient knowledge about antibiotic use.

**Keywords:** Knowledge, Attitude, Practice, Antibiotic use, Misuse.

### INTRODUCTION

Although the high prevalence of bacterial resistance to antibiotics, they are chief treatments that used for bacterial infections<sup>(1-3)</sup>. This high prevalence could be attributed to the drug abuse and overuse that would result in antimicrobial resistance which in turn threaten the antibiotics efficiency, longer and severe episodes of diseases<sup>(4,5)</sup>. Also, the drug misuse would increase the costs of treatments, morbidity and mortality rates<sup>(6)</sup>.

The misuse of antibiotics could be due to less knowledge of prescribers, the demand of the patients, weak spreading awareness among patients through physicians and negative attitude and practice pattern<sup>(7-9)</sup>. The utilization of antibiotic control methods are important factors that involves interactions between health caregivers, community pharmacists and populations<sup>(10,11)</sup>.

In the middle East Counties including Saudi Arabia, receiving antibiotics is easy and considered as over the counter drug and there are no restrictions on using such medications and could be bought without a prescription<sup>(12,13)</sup>.

Many studies were conducted addressing the knowledge, attitude and practice of Saudi population toward antibiotic use in order to enhance the general awareness of the population

thus reducing the undesirable effects of antibiotic misuse<sup>(14-18)</sup>. The present study aimed at assessing the KAP of Saudi adult subjects toward the use of antibiotics.

### METHODS

#### *Study design*

A cross-sectional questionnaire based study was conducted at AL-Mahd General Hospital in Al-Madinah Al-Monawara, Saudi Arabia, Ministry of Health, from February to June 2017.

#### *Study population and sample size:*

After taking into consideration the population size of the hospital during the last 4 months, the sample size was calculated using website calculator<sup>(19)</sup> with a response rate of 50% and a confidence interval 95% then the sample size was calculated as 753 subjects from which 721 respondents completed the full questionnaire. The inclusion criteria were Saudi subjects aged 16 years old or more and could read and write in Arabic language.

#### *Study tools:*

A systemic search was done using Pubmed, Scopus, Research gate, Google Scholar and other search engines by the following keywords: antibiotics, antimicrobials (AMS), antibiotic

resistance, antibiotic use knowledge, attitude and practice for preparing a valid and reliable questionnaire.

The questionnaire was reviewed by 3 experts in infectious diseases then validated and translated into simple Arabic language. The questionnaire consisted of 4 parts. The first part concerned with the demographic information of participants and the source of their knowledge about the current issue. The other parts included questions related to knowledge, attitude and practice of respondents.

**Ethical approval:**

The study was approved by the ethical committee and institutional review board of the AL-Mahd General Hospital. Also, all participants gave informed consent before participating in the study.

**Statistical analysis :**

The data were processed using the Statistical Package for Social Sciences (SPSS, version 22) for windows. The quantitative variables were presented as rate and percentage. The numerical data were reported by the means ± standard deviation. The association between the

knowledge and subjects' demographics was assessed using Univariate logistic regression. P value < 0.05 is considered significant.

**RESULTS**

**Demographics of the studied subjects:**

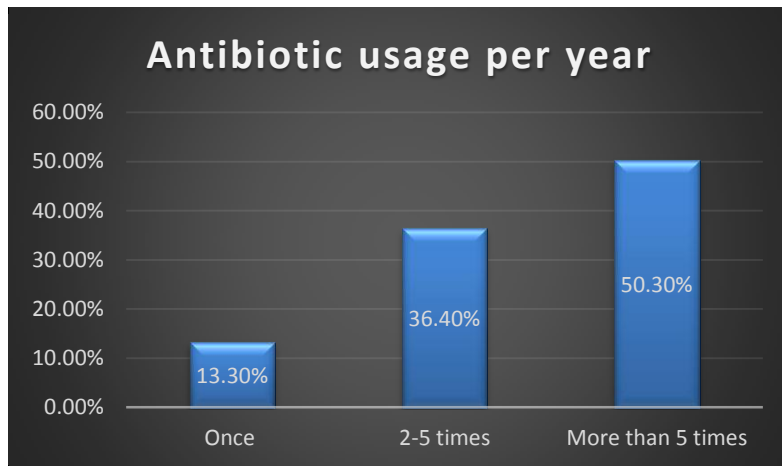
The characteristics of the studied population are shown in Table. 1. The age of included subjects ranged from 16-35 years old in 50.9%, 36-50 years in 32.9% and 16.2% aged more than 50 years old. More than half of participants were males (55%) and 45% were females. As for the educational level, the majority of respondents (60.2%) had a college degree, 26.9% had a secondary school degree and 12.9% had primary school degree. The income was moderate in 60.9% of subjects, low in 15% and high among 24.1% of respondents. The most common source of knowledge among participants was a physician (50.8%) followed by internet in 25.9% and TV among 14.3% and the least source of knowledge was relatives among 9% of volunteers.

**Table (1): Demographic Characteristics of included subjects (721)**

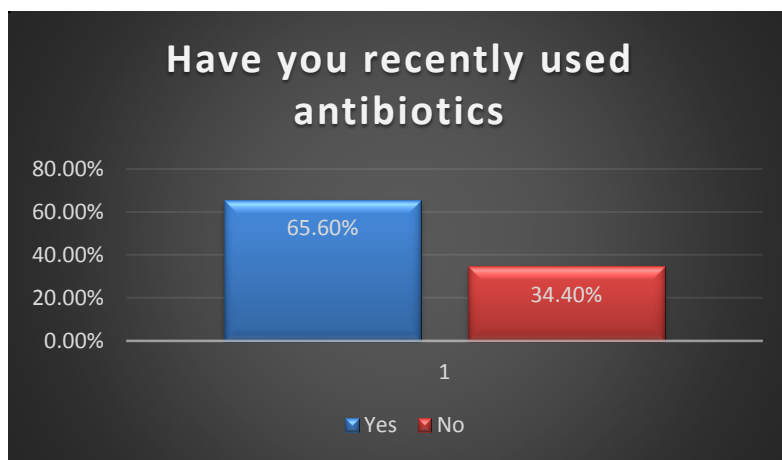
<b>16-35</b>	367	50.9
<b>36-50</b>	237	32.9
<b>&gt;50</b>	117	16.2
<b>Female</b>	324	45%
<b>Male</b>	397	55%
<b>Collage</b>	434	60.2%
<b>Secondary School</b>	194	26.9%
<b>Primary School</b>	93	12.9%
<b>Low</b>	108	15%
<b>Moderate</b>	439	60.9%
<b>High</b>	174	24.1%
<b>From relatives</b>	65	9
<b>Internet</b>	187	25.9
<b>TV</b>	103	14.3
<b>Physician</b>	366	50.8

**Prevalence of antibiotic use by the participants:**

The prevalence of antibiotic use among participants per year showed that about half of respondents (363 subjects, 50.3%) used antibiotics more than 5 times per year while 262 (36.4%) used antibiotics from 2-5 times per year and only 96 (13.3%) used antibiotics for one time per year (Figure. 1). Also, 473 (65.6%) of volunteers admitted recent usage of antibiotics and 248 (34.4%) have not recently used antibiotics (Figure. 2)



**Figure 1:** antibiotic usage per year among respondents.



**Figure 2:** the recent antibiotic usage among volunteers.

**Assessment of knowledge of included subjects**

The respondents’ awareness of antibiotic usage is illustrated in Table. 2. Most of the subjects 60% considered antibiotics as over the counter drugs. A good knowledge was indicated among participants regarding the usage of antibiotics under prescription (60.1%) and the usage of antibiotics for treatment of bacterial infection (66.3%). A total of 43.3% has sufficient knowledge regarding the specifications of using antibiotics. Also, 52.1% and 60.7% have good knowledge regarding the side effects and antimicrobial resistance that result from antibiotic misuse, respectively. On the other hand, insufficient knowledge was found among 59.8% of subjects regarding the antibiotic drug interaction, allergy to specific antibiotics (85.6%) and the essential knowledge about broad-spectrum antibiotics (61.4%) (Table 2).

**Table (2): Awareness regarding the use of Antibiotics:**

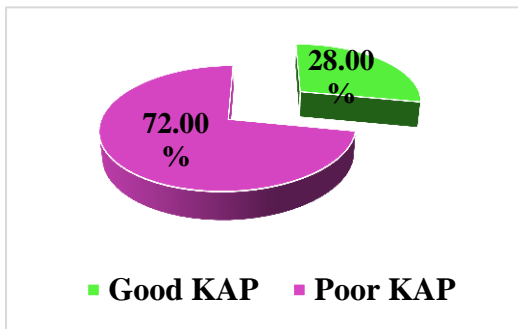
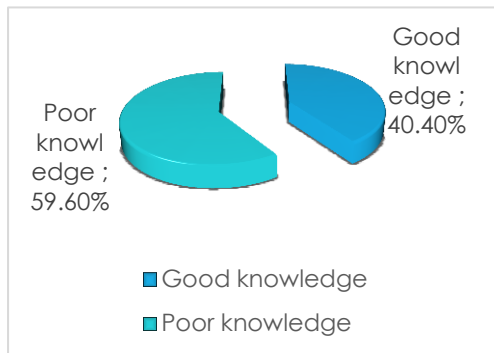
Antibiotics are considered as over the counter drugs	289 (40%)	432 (60%)
Antibiotics should be used by a physician prescription	329 (60.1%)	218 (33.8%)
Antibiotics are used bacterial infection	478 (66.3%)	243 (33.7%)
Specific antibiotics are needed for specific infections	312 (43.3%)	409 (56.7%)
Antibiotics misuse could result in many side effects	376 (52.1%)	345 (47.9%)
Overuse of antibiotics could derive antimicrobial resistance	438 (60.7%)	283 (39.3%)
Antibiotics may cause drug interaction and reduce certain drugs efficiency	290 (40.2%)	431 (59.8%)
Some patients may have allergy to specific antibiotics	104 (14.4%)	617 (85.6%)
Knowledge of broad-spectrum antibiotics is essential	278 (38.6%)	443 (61.4%)

**Level of knowledge among respondents:**

The level of knowledge was poor among 59.6% of respondents and was sufficient for 40.4% of subjects (Table. 3& Figure. 3).

**Table (3): Respondents’ KAP of antibiotic use**

Knowledge	Frequency	Percent (%)
Good (5-9)	291	40.4
Poor (0-4)	430	59.6
	721	100,0



**Figure 3 and 4:** Respondent’s knowledge about antibiotic use

**Evaluating the subject’s attitude**

The attitude of included subjects is represented in table. 3. The attitude of the subjects was negative toward completing the course of antibiotics in 59% of respondents. Also, 59.8% showed a negative and wrong attitude toward taking antibiotics prescriptions from relatives. The negative attitude was also shown among 67.8% of the subjects who ask the physician to prescribe

antibiotic for fever and cough while 32.2% showed a positive attitude for not using antibiotics for fever and cough. In addition, most of the participants (65%) would use antibiotics by their own which induced a negative overall attitude among the majority of the participants (Table. 4).

**Table (4): Attitude of respondents toward antibiotic use (n=721)**

	No.	(%)
I always complete the course of antibiotic		
Agree	295	41
Disagree	426	59
I get antibiotic prescriptions from relatives without visiting physician		
Yes	431	59.8
No	290	40.2
I ask the physician to prescribe antibiotic for fever and cough		
Yes	489	67.8
No	232	32.2
I usually use antibiotics by my self		
Agree	468	65
Disagree	253	35

**Practice pattern of included subjects**

The respondent’s practice is indicated in Table. 5. About 74.9% of participants would ask the physician to prescribe antibiotics. While less than half of respondents would follow the physician instructions of using antibiotics. 66.6% would not trust the physician decision for not prescribing antibiotics showing an insufficient practice pattern. Only 37% would use antibiotics with prescriptions but 63% bought antibiotics without prescriptions. Also, 53% would change the physician for not prescribing antibiotics. The overall practice pattern was poor among most of the respondents.

**Table (5): respondents' practice toward antibiotic use (n=721)**

<b>1.I usually ask physician to prescribe antibiotic</b>	<b>540 (74.9%)</b>	<b>181 (25.1%)</b>
<b>2.Do you follow all instructions of the physician when using antibiotic?</b>	<b>344 (47.7%)</b>	<b>377 (52.3%)</b>
<b>3.I trust the physician decision when deciding not to prescribe antibiotic</b>	<b>241 (33.4%)</b>	<b>480 (66.6%)</b>
<b>4.Antibiotics should be administrated with a prescription?</b>	<b>267 (37%)</b>	<b>454 (63%)</b>
<b>5.I change the physician for not prescribing antibiotics</b>	<b>382 (53%)</b>	<b>339 (47%)</b>

**Association between subjects' knowledge and demographics:**

The association between subjects' knowledge and demographics was assessed using Univariate logistic regression model and indicated that the good knowledge was associated with being young, female and higher education degree while the insufficient knowledge was associated with being old, male and less educated (Table. 6).

**Table. 6: Association between knowledge of antibiotic use and demographic variables:**

	<b>Good (n=291)</b>		<b>Poor (n=430)</b>		<b>OR</b>	<b>95%CI</b>	<b>P-value</b>
<b>16-35</b>	176	48-%	191	52%	1	Reference	0.718
<b>36-50</b>	82	34.6%	155	65.4%	1.33	0.71-1.63	0.107
<b>&gt;50</b>	33	28.2%	84	71.8%	2.11	0.32-0.89	0.032*
<b>Female</b>	158	48.8%	166	51.2%	1	Reference	0.421
<b>Male</b>	133	33.5%	264	66.5%	2.98	1.25-3.66	0.033*
<b>Collage</b>	184	42.4%	250	57.6%	1	Reference	0.924
<b>Secondary School</b>	86	44.3%	108	55.7%	1.05	0.54-1.97	0.211
<b>Primary School</b>	21	22.6%	72	77.4%	2.11	0.36-0.93	0.019*

OR; Odds Ratio, 95%CI: Confidence Interval

**DISCUSSION**

Antibiotics are used for the treatment of various disease especially bacterial infections<sup>(20, 21)</sup>. However, during the last decades due to the uncontrolled and misuse of antibiotics, the world witnessed a great evolution in the spread of microbial resistance that impacts the health, economic burden, prolonged hospital stay, higher mortality rates<sup>(1, 22)</sup>.

The present study showed a high level of using antibiotics per year among most of the respondents and the level of knowledge was also poor which in turn resulted in a negative attitude and poor practice pattern. Also, most of the participants would buy antibiotics without

prescriptions and have a negative attitude toward changing the physician for not prescribing antibiotics.

Many studies in KSA revealed a poor knowledge and wrong practice pattern among most of the Saudi subjects. In Riyadh, about 77.6% of adult subjects would buy antibiotics without prescriptions<sup>(23)</sup>. Also, a high incidence of antibiotic misuse was found among 38.7% of pediatric and 57.8% of adult emergency department at the King Abdullah international medical research centre<sup>(24)</sup>. In addition, the antibiotic misuse was associated with a high rate of infections in a community hospital in KSA<sup>(25)</sup>.

Accordingly, the over the counter use of antibiotics was 97.9% among sixty randomly selected pharmacies in Jeddah-KSA <sup>(26)</sup>. In KSA, many researchers declared that the antibiotics are obtainable without prescriptions <sup>(27, 28)</sup>.

Recently, an insufficient knowledge regarding the uses, side effects, antibiotic drug interaction, allergy to specific antibiotics and uses of broad-spectrum antibiotics were found in Saudi Arabia and the majority of respondents buy antibiotics without prescriptions <sup>(29)</sup>.

Reports from other Arab countries showed a high rate of overuse, misuse and self-medication of antibiotics in Egypt, Iraq, Palestine, and Jordan <sup>(30-34)</sup>.

This study showed that the good knowledge was associated with being young, female and higher educational degree. Correspondingly, the female gender and high levels of educations were associated with sufficient knowledge <sup>(35)</sup>. Also, more educated people and young age were more correlated to the sufficient awareness <sup>(36)</sup>.

## CONCLUSION

The level of knowledge was insufficient and resulted in inappropriate attitude and practice pattern in KSA. The lower educational degree, young age and female gender were significant contributors to sufficient knowledge about antibiotic use. Educational programs should be carried out by health authorities that focus on the appropriate use of antibiotics. Also, legal restrictions should be enhanced for accessing antibiotics.

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