

## Research Article

# Factors Affecting Knowledge, Attitude and Perception Towards Antibiotic Usage Among Local Community in Selangor, Malaysia

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## ABSTRACT

Antibiotic resistance is a seriously growing health issue, not just confined to Malaysia but spreading globally at an alarming rate. Although antimicrobial resistance cannot be eradicated completely, however certain measures can be taken to slow down its progression and the consequential impact it has on the health-care setting. The objective of this study is to assess knowledge, attitude and perception towards antibiotic usage among the local community in Malaysia. A cross-sectional study was conducted prospectively in the state of Selangor, within 6-weeks. Data was collected from a total number of 285 participants using a validated questionnaire on antibiotics. We analyzed demographic factors and socioeconomic factors affecting our main outcomes of interest; knowledge, attitude and practice. The mean age of our study population was approximately 27.45 years (SD=12.12), ranging between 18-63 years, mostly consisted of the younger age group (50.5%). Majority of the study participants were females (n=203, 71.2%), and graduates (57.9%). Overall, the participants showed good level of knowledge (n=197, 69.1%) and perception (n=240, 84.2%), but their attitude towards antibiotic use was slightly unsatisfactory (n =159, 55.8%). Both perception and attitude were much better among the older age group (95% CI, p <0.05). Women demonstrated a better perception in comparison to men (n =178, 74.2%) having statistical significance as p-value=0.40. We also deduced a significant association between educational status in relation to knowledge (p=0.033) and perception (p=0.011) among Malaysian population. In conclusion, rapidly spreading resistant bacteria can threaten the health benefits attained by antibiotics usage thus, leading towards a global crisis and economic burden. Hence, this study managed to highlight the antibiotic misuse in Malaysians as well as the factors significantly associated with poor knowledge, attitude and perception.

**Keywords:** Knowledge, Attitude, Practice, Antibiotic, Resistance

## INTRODUCTION

The potential hazards of antimicrobial resistance (AMR) are escalating worldwide at a faster rate due to the improper usage of antimicrobial agents [1], inadequate infection control and lack of hygiene [2]. No one ever denies that since its discovery, antibiotics have been saving millions lives. On the other hand, the irresponsible use of antibiotics contributed much to the development of resistant strains [3]. The correlation between rapidly emerging resistant pathogens and antibiotics misuse has been clearly identified in numerous scientific studies [4, 5, 6].

Antimicrobial agents are relatively the largest group of medications utilized in Malaysian

healthcare system [7]. Data from the National Medical Care Survey (NMCS) emphasizing on frequency and characteristics of antibiotic prescribing trends in Malaysia, suggested that the prescribing rates are substantially high for both public and private sectors in a primary care setting. Upper respiratory tract infection is the most frequently diagnosed condition in patients receiving antibiotic therapy followed by urinary tract infection and gastroenteritis. Penicillin prescriptions are the highest in existence, nevertheless, cephalosporin and macrolides are also commonly prescribed [8].

Previous studies have evidently shown poor attitude towards antibiotic usage among the

young Malaysians, while positive attitude and good perception were associated with specific ethnic groups and high income classes [9].

The International Pharmaceutical Federation (FIP) Statement of Policy Control on Antimicrobial Medicines Resistance and WHO Global Strategy for Containment of Antimicrobial Resistance urged policy makers and health authorities to develop educational programs and awareness campaigns in response to the worldwide antibiotic resistance [10].

Antibiotic misuse directly affects the emergence of genetically mutated, virulent and antibiotic resistant, new generation of highly aggressive microbes and pathogens. Therefore, more studies should be consistently performed in order to overcome this global public health concern. Factors associated with antibiotics misuse should be further analyzed and preventive measures should be initiated to educate communities on the proper usage of antibiotics and the effectiveness of current antibiotics against common infections.

## MATERIALS AND METHODS

A cross-sectional study was conducted prospectively for a period of 6 weeks from March until April 2019. The main objective of this study is to assess the level of knowledge, attitude and practice among Malaysian adults towards antibiotic use.

The study was carried out in Selangor province which is the second biggest state after Kuala Lumpur state. Vast areas were covered in that huge state, we targeted areas whereby people were more clustered and also relatively available for participation such as restaurants, train stations, malls and parks. The inclusion criteria for this study was recruiting respondents who are Malaysia,  $\geq 18$  years, with the ability to read and understand the questionnaire, and are familiar with the term 'antibiotic'.

Data collection mainly involved demographic, cognitive, behavioral and perceptive outlook towards antibiotic usage. Knowledge about antibiotics stewardship and the impact of antibiotics misuse on self and community health was also evaluated. Identical questionnaire with 21 questions to collect demographic data, determine socioeconomic status, knowledge and belief on antibiotics and the effect of antibiotics misuse. The questionnaire was tested first on small group of non-medical college students. Participant's responses were categorized as poor or good according to the points scored in their answers.

Written consent was obtained from each participant after brief explanation about the study and before the initiation of filling questionnaire. This study received ethical approval from the Institutional Review Board, Perdana University under ID; PU IRBHR0175.

Data analysis was performed using the statistical package SPSS version 22.0 (IBM; Armonk, NY). Descriptive statistics such as means, standard deviations and frequencies were used to analyze the continuous and categorical data. We further examined the respondents' demographic factors such as age, gender and education in relation to their awareness on antibiotics usage. A Chi-square and/or Fisher's exact test was done to compare and assess any possible relationship between the level of knowledge, attitude and perception; with p-value  $< 0.05$  was considered to be statistically significant.

## RESULTS

A total number of 285 participants were included in the study (Table 1). The majority of the respondents are females (n = 203, 71.2%), of younger age group (50.5%), and educated as degree holders (57.9%).

**Table 1: Demographics of the participants**

Variable	Mean $\pm$ SD	Frequency (%)
<b>Gender</b>		
Male		80 (28.1)
Female		203 (71.2)
Prefer not to say		2 (0.7)
<b>Age</b>	27.45 $\pm$ 12.12	
$\leq 20$		96 (33.7)
21-40		144 (50.5)

≥ 40		45 (15.8)
Education		
SPM		13 (4.6)
Pre-University		70 (24.6)
Degree		165 (57.9)
Masters, PhD		35 (12.3)
Others		2 (0.7)
Health		
Yes		73 (25.6)
No		212 (74.4)
<b>Total</b>		<b>285</b>

In general, the knowledge and perception towards antibiotics stewardship is reasonable, but the attitude towards and against unnecessary antibiotics consumption is almost equivalent (refer to Table 2).

**Table 2: Comparison based on total KAP percentage**

		Poor	Good
Survey item	Mean (SD)	n (%)	n (%)
Knowledge	61.09 (21.11)	88 (30.9)	197 (69.1)
Attitude	52.91 (27.66)	126 (44.2)	159 (55.8)
Perception	75.61 (17.60)	45 (15.8)	240 (84.2)

Further analysis (Table 3.a, 3.b, 3.c) to determine the association between knowledge, attitude and perception in relation to gender showed that perception among females is much better than males (P=0.04).

**Table 3.a: Association between gender and knowledge towards antibiotic stewardship**

Knowledge					
n (%)	n (%)	Male	Female	Prefer not to say	p-value <sup>a</sup>
Poor	88 (100.0)	19 (21.6)	69 (78.4)	0 (0.0)	
Good	197 (100.0)	61 (31.0)	134 (68.0)	2 (1.0)	0.187
Total	285 (100.0)	80 (28.1)	203 (71.2)	2 (0.7)	

<sup>a</sup> Fisher's Exact test

**Table 3.b: Association between gender and attitude towards antibiotics use/misuse**

Attitude					
n (%)	n (%)		Gender		p-value <sup>a</sup>

		Male	Female	Prefer not to say	
Poor	126 (100.0)	34 (27.0)	91 (72.2)	1 (0.8)	
Good	159 (100.0)	46 (28.9)	112 (70.4)	1 (0.6)	0.896
Total	285 (100.0)	80 (28.1)	203 (71.2)	2 (0.7)	

<sup>a</sup> Fisher's Exact test

**Table 3.c: Association between gender and perception in relation to antibiotics misuse**

Perception					
n (%)	n (%)		Gender		p-value <sup>a</sup>
		Male	Female	Prefer not to say	
Poor	45 (100.0)	20 (44.4)	25 (55.6)	0 (0.0)	
Good	240 (100.0)	60 (25.0)	178 (74.2)	2 (0.8)	<b>0.040</b>
Total	285 (100.0)	80 (28.1)	203 (71.2)	2 (0.7)	

<sup>a</sup> Fisher's Exact test

We also evaluated the impact of education level on the participants' opinion regarding antibiotics misuse and whether or not they prefer to take antibiotics for viral infections, such as common

cold and flu. (Table 4.a, 4.b). The highest level of knowledge is found among degree holders, while practice is better in those who have achieved postgraduate degree.

**Table 4.a: Comparison of knowledge among different education level**

Knowledge	Education					p-value <sup>a</sup>
	SPM	Pre-university	Degree	Master/PhD	Others	
Poor	3 (6.7%)	17 (37.8%)	22 (48.9%)	2 (4.4%)	1 (2.2%)	
Good	10 (4.2%)	53 (22.1%)	143 (59.6%)	33 (13.8%)	1 (0.4%)	<b>0.033</b>
Total	13 (4.6%)	70 (24.6%)	165 (57.9%)	35 (12.3%)	2 (0.7%)	

<sup>a</sup> Fisher's Exact test

**Table 4.b: Comparing practice among different education level**

Education	n	Practice (%) mean (SD)	f statistic (df)	p-value <sup>a</sup>
SPM	13	74.0 (15.7)		
Pre-university	70	69.8 (20.0)	3.32 (4,280)	<b>0.011</b>
Degree	165	76.9 (16.6)		
Master, PhD	35	81.8 (14.0)		
Others	2	75.0 (35.4)		

<sup>a</sup> One-way Anova test

In regards to age differences, both perception and attitude are better among the older age group (Table 5.a, 5.b).

**Table 5.a: Mean age comparison for perception**

Perception	n	Age (years) Mean (SD)	Mean Difference (95% CI)	t statistic (df)	p-value <sup>a</sup>
Poor	45	22.24 (4.44)	-6.18	-5.83	0.0001
Good	240	28.43 (12.8)	(-4.08, -8.27)	(200)	

<sup>a</sup> Independent t-test

**Table 5.b: Mean age comparison for attitude**

Attitude	n	Age (years) Mean (SD)	Mean Difference (95% CI)	t statistic (df)	p-value <sup>a</sup>
Poor	126	25.61 (10.8)	-3.3	-2.35	0.020
Good	159	28.91 (12.9)	(-5.3, -6.1)	(282)	

<sup>a</sup> Independent t-test

## DISCUSSION

This study aimed to highlight knowledge, attitude and perception of the Malaysian adults towards antibiotics use and also to identify factors associated with the main outcomes of interest.

### Knowledge

The total number of participants with good knowledge level is about 197 (69.1%). Unfortunately, 61.4% has the misconception that bacteria are germs which cause common cold and flu, while 50.9% do not know that antibiotic resistance is an important and serious public health issue in our country. Almost half of the study population (49.8%) do not agree to the statement that indiscriminate use of antibiotics can lead to additional burden of medical cost to the patient. Empirical studies suggest that individuals from low socioeconomic community choose self-medication to avoid high treatment cost.

### Attitude

The level of attitude is found to be mildly satisfactory as 55.8% subjects show good attitude and the remaining 44.2% (n=126) have poor attitude towards antibiotics use. Around 52.3% of the participants wrongly believed that antibiotics help them to get better more quickly when they get fever. This finding resembles a study done in Kuwait which demonstrated 54.4% respondents with similar attitude [11]. Furthermore, it was also observed that 57.5% of our participants are totally unaware of the fact that whenever they take an antibiotic they contribute to the development of antibiotic resistance.

### Perception

The overall perception among Malaysian adults in this study is relatively good (81.2%). About 79.3%

always consult a doctor before starting an antibiotic course, 25.3% occasionally stop taking further treatment once they start feeling better, and 46.6% rarely or never discard the remaining leftover antibiotic.

Multivariate analysis shows that among the studied demographic characteristics, education, age, and gender are found to be important indicators responsible for affecting the outcomes of interest. Our study shows negative relationship between education level with antibiotics misuse and drug resistance, which is in consistence with other studies with same results [12, 13, 14, 15]. The least knowledgeable educated group of participants are SPM (4.2%) and the highest are degree holders (59.6%). Lower educational level is significantly associated with knowledge (CI=95%, p-value=0.033).

One-way Anova test shows significant relationship between educational level and perception about antibiotics use (p-value=0.011) found highly among postgraduate participants (81.8%). The association between age and perception is also established through the use of parametric test, e.g. an independent t-test which showed statistically significant results (p-value= 0.0001 & p-value=0.020) for perception and attitude respectively. Although it was noted that the older participants had better attitude and perception, but there is no significant association between age and knowledge.

## CONCLUSION

Antibiotic resistance is a global concern [16] that causes difficulty in treating infectious diseases, eventually leading to higher morbidity and mortality [17].

Epidemiological infections due to antimicrobial resistant bacteria have emerged out as a constant threat and strategizing challenge in Malaysia [18].

A good understanding of the current knowledge, attitude and perception among Malaysian adults in regards to antibiotic use or misuse could be an important development in causing awareness education program [19]. Therefore, in terms of current evidence, based on factors affecting antibiotics use among Malaysian population; the study has proven to be of utmost significance and relevance.

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