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Knowledge and Attitude Towards Antibiotic Usage Among General Public in Shah Alam, Malaysia

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Abstract

The emergence of superbugs and antibiotic resistance bacteria nowadays make a limited choice of antibiotic available for treatment. This circumstance is an alarming to public health. Thus, public knowledge and attitude towards antibiotic usage play an important role in the success of treatment process. This study aimed to evaluate public knowledge and attitude towards antibiotic utilization and the association of knowledge with demographic variables. A self-administered cross-sectional survey was conducted involving 380 respondents by using a pre-validate questionnaire at public places in Shah Alam, Malaysia from January 2014 to April 2014.

From this study, it was analyzed that 43% of respondents have good knowledge towards antibiotic. Majority of the respondents knew antibiotic is used for bacterial infection. However, 40% of respondents misunderstood that antibiotic is indicated for viral infection. Half of the respondents know how to differentiate antibiotic with other drugs. High number of respondents, 63.2% knows that they need to complete full course of antibiotic, however in the attitude statement; only 57.9% of respondents complete their antibiotic course.Based on the percentage of correct response on the attitude statement positive attitude was observed. However, 57.4% still expect antibiotic to be prescribed for common cold. Demographic characteristics such as gender, race, educational level and healthcare occupation were found significant association with knowledge of antibiotic usage. It has been concluded that although knowledge of public is good, public should be stressed out of the importance of correct usage of antibiotic and promote changes in their attitude towards antibiotic usage.

1 Introduction

Antibiotic resistance is a major threat in public health and modern medicine. It is one of the most commonly prescribed medicines in most of the countries. In Malaysia, antibacterial for systemic use is the ninth most used therapeutic group in 2008 with 70% of total usage contributed by private sector. The largest class of antibacterial used in 2008 was penicillins followed by macrolides, tetracyclines, other beta lactam antibacterials, fluoroquinolones and others[1].

According to Antibiotic Threats in United States, 2013, conducted by Centers for Disease Control and Prevention, there are almost 2,049,442 illness and 23,000 death due to bacterial infection are reports in US each year [2]. Majority of antibiotic resistance infections happen in general public while on the other handmost of the deaths related to antibiotic resistance occur in healthcare setting[2].

Antibiotic consumption is a key driver of resistance although the relationship is complex [3]. Therefore, to reduce the negative effect on public health, a jointly effort is requires in surveillance, public health awareness on dangers of resistance, and a clear policy on procurement and prudent use of antibiotics in these resource poor settings[4]. The use of antimicrobial drugs, no matter how well controlled, it can still lead to the selection of drugs resistance pathogen [4]. Public may aware of antibiotic resistance but they are still unaware on the proper usage of antibiotic. Thus, it is important to assess the knowledge and attitude of public in order to reduce

antibiotic resistance. From there we can provide exposure on antibiotic usage by using campaign, talk, media, counseling and etc.

2 Materials and method

2.1 Study Type

A cross-sectional survey with convenience sampling method had been used for this study. This research used a pre-validated questionnaire to obtain the data and information. The questionnaire was obtained from previous studies on Public Knowledge and Attitude towards Antibiotic Usage in Putrajaya, Malaysia.

2.2 Population and Area

The population selected was general public in Shah Alam. The areas involved were Section 7, Section 9, Section 12, Section 14 and Section 18 Shah Alam. These places were chosen based on criteria such as the center of attraction, have high residential and population area, near to public places such as recreational area and shopping mall. The population of Shah Alam is 541, 306 people (Department of Statistic Malaysia, 2010). Sample size for this research is calculated by using Raosoft Software with confidence interval 95% and margin error of 5%. Sample needed is 380 respondents.

2.3 Inclusion and exclusion criteria

Inclusion criteria were adult age 18 years old and above, able to read and understand Malay or English language and aware of the term antibiotic. Other than these criteria were excluded.

2.4 Questionnaire

Questionnaire consists of 4 parts which was a) demographic characteristics, b) usage of antibiotic, c) knowledge of antibiotic, d) attitude towards antibiotic usage.

2.5 Statistical Analysis

Only fully completed questionnaires were included for analysis. The numerical data were analyzed by inferential statistics. Each correct responsewas given „1" score and incorrect or "Not Sure" response were given „0" score. The total knowledge scores were categorized into three levels indicated by poor (0-3), moderate (4-7) and good (8-12). Data were analyzed by using Statistical Package for theSocial Science. The associations of knowledge and demographic data such as age, gender, race, highest educational status and occupation related to healthcare were tested by using Chi-Square Test. In all statistical analysis, a P-value <0.05 was considered to be statistically significant. Pearson's Correlation was used to examine the relation-ship between antibiotic knowledge and attitude.

3 Results

3.1 Demographic data

A total of 400 questionnaires were distributed to the general public at different sections of Shah Alam. However, 20 of the questionnaires were found incomplete and there were excluded from the study. As shown in table 1, there was highest respondent from the age group between 18 to 30 years old which accounted for 51.3%. Majority of the respondents were female (65%) and Malay (62.1%). Most of the respondents (74.7%) had completed college/university. From the result obtained regarding the usage of antibiotics (Table 2), 29.2 % (n=111) of the respondents reported using antibiotics one month prior to the survey. Of those who took antibiotics the majority (23.9%) were prescribed after consultation with the doctor, while the remaining 5.3% reported that their antibiotics were obtained without consultation either from private clinic, retail pharmacy or used by someone else. The reasons for taking antibiotics were mostly due to fever 17.4% or respiratory tract infection 17.4%.

3.2 Knowledge of antibiotic

Majority of respondents, 42.6% (n=162) had a good knowledge on antibiotic usage followed by 37.6% (n=143) have moderate knowledge of antibiotic with a median score of 7 (Table 3 and Table 4). There was a statistically significant difference in knowledge level was noted between gender (p= 0.03), race/ ethnicities (p=0.001), level of education (p<0.001) and occupation related to healthcare (p<0.001). There was no significant difference in knowledge with the age of respondents (p=0.237).

Based on the statement given in the survey, most of the respondents answer correctly on the role of antibiotic is to kill bacteria, 80.3% (n=305). However, 39.5% (n=150) of the respondents also answered that antibiotic is used to kill viral. Nearly half of the respondents 51.6% (n=196) knows that antibiotic can kill bacteria that normally live in the gut and skin and 46.6% (n=177) respondents know that these bacteria are good for health. In terms of adverse effect of antibiotic, 72.9% (n=277) respondents answer that antibiotic can cause allergic reactions (Table 5). However, more than 50% of respondents answer antibiotic does not cause side effects and overuse of antibiotic does not cause antibiotic to lose its effectiveness. On the knowledge of administration, only 24.2% (n=92) answer it is not okay to stop taking antibiotic when symptoms improving, and 12.9% (n=49) respondents answer no for the statement "taking less antibiotic than prescribed is more healthy than taking full course prescribed".

3.3 Attitude towards antibiotic usage

Positive attitude was observed based on the percentage of the correct answer on attitude statement in Table 6. There is a weak correlation between the knowledge statements on administration of antibiotic with attitude statement, which state that it is okay to stop

taking antibiotic once symptoms are resolved (r=0.213, n=380, p<0.001).

Table 1: Summary of demographic data

Characteristics	Number (n = 380)	Percentage (%)
Age		
18-30	195	51.3
31-40	94	24.7
41-50	69	18.2
51-60	20	5.3
>60	2	0.5
Gender		
Male	133	35
Female	247	65
Race		
Malay	236	62.1
Chinese	59	15.5
Indian	73	19.2
Others	12	3.2
Highest Educational Status		
Primary or Lower	5	1.3
Secondary	91	23.9
College/University	284	74.7
Employment status		
Employed for wages	182	47.9
Self employed	38	10
Student	135	35.5
Housewife/househusband	13	3.4
Retired/unemployed	12	3.2
Occupation related to healthcare		
Yes	111	29.2
No	269	70.8
Family member's occupation related to healthcare		
Yes	107	28.2
No	273	71.8
Location to seek healthcare		
Government clinic/hospital	148	38.9
Pharmacy	87	22.9
Private clinic/hospital	139	36.6
Others	6	1.6
Having long term disease		
Yes	36	9.5
No	344	90.5

Table 2: Usage of antibiotic

Recent use (within 1 month)	Number (n= 380)	Percentage (%)
Yes	111	29.2
No	269	70.8
Source of Antibiotic		
Prescribed after consultation	91	23.9
Purchased at private clinic without consultation	9	2.4
Retail pharmacy	10	2.6
Use someone else's	1	0.3
Reason taking antibiotic		
Urinary Tract Infection	12	3.2
Fever	66	17.4
Respiratory Tract Infection	25	6.6
Skin problem/wound	4	1.1
Pain/Inflammation	3	0.8

Table 3: Level of Knowledge

Level of knowledge	Total score	Number (%)
Poor	0-3	75 (19.7)
Moderate	4-7	143 (37.6)
Good	8-12	162 (42.6)

4 Discussion

4.1 Usage of antibiotic

In this survey, only 29.2% respondents took antibiotic for the past 1 month which is higher than reported in Penang and Putrajaya, 28.9% and 16.5% respectively [8, 9]. However, the main indication reported in this survey is similar with both of the survey in Putrajaya and Penang, with fever being the main reason of taking antibiotics[8, 9]. In this study, 5.0% of respondents obtained their antibiotic without prescription from retail pharmacy and private clinic although it is illegal. Compared to previous research in Penang, 7.5% were reported to obtain the antibiotic without prescription and in Putrajaya they have a low percentage of the respondent which is 4.5% obtain antibiotic without prescriptions[8, 9]. In another research in oversea which is at Hong Kong, around 9.0% received antibiotic without prescription[12].

4.2 Knowledge of antibiotic

The level of knowledge of the study population is moderate to good with 37.6% to 42.6% compared to a study in Penang which has a

moderate level of knowledge, 54.7% [8]. In this study, most of the respondents know that antibiotic was indicated for bacterial infection, 80.3% which are slightly higher than reported in Sweden, 77.2% [7] and in Penang, 76.7%.In other knowledge statement40.5%of therespondents had amisunderstanding that antibiotic can be used to treat the viral infection which is relatively high as compared to study done in Sweden which is 26.8% [7]. Total of 60.5% of respondents in this study failed to identify that antibiotic do not eradicate viral infections. Studies in Penang and Putrajaya both have more than 80% of respondents failing to identify this usage of antibiotic, however only 53.0% was reported in UK studies [8, 9, 13]. Compared to UK studies, only 38% answer that antibiotic can be use in treatment of most cold and cough, in which this studies have higher percentage of respondent who agree with that statements which is 52.6% [13].

Table 4: Association of demographic data with level of knowledge of respondent

Characteristic	Level of knowledge			*P*- value*
	Poor (%)	Moderate (%)	Good (%)	
Age				
18-30	36 (9.5%)	72 (18.9%)	87 (22.9%)	
31-40	20 (5.3%)	34 (8.9%)	40 (10.5%)	
41-50	10 (2.6%)	28 (7.4%)	31 (8.2%)	0.252
50-60	8 (2.1%)	8 (2.1%)	4 (1.1%)	
>61	1 (0.3%)	1 (0.3%)	-	
Gender				
Male	14 (3.7%)	56 (14.7%)	63 (16.6%)	0.04
Female	61 (16.1%)	87 (22.9%)	99 (26.1%)	
Race				
Malay	55 (14.5%)	102 (26.8%)	79 (20.8%)	
Chinese	8 (2.1%)	20 (5.3%)	31 (8.2%)	0.001
Indian	11 (2.9%)	17 (4.5%)	45 (11.8%)	
Others	1 (0.3%)	4 (1.1%)	7 (1.8%)	
Highest education				
Primary school	1 (0.3%)	3 (0.8%)	1 (0.3%)	
Secondary school	26 (6.8%)	50 (13.2%)	15 (3.9%)	< 0.001
College/university	48 (12.6%)	90 (23.7%)	146 (38.4%)	
Occupation related to healthcare				
Yes	9 (2.4%)	26 (9.5%)	76 (20%)	< 0.001
No	66 (17.4%)	117 (30.8%)	86 (22.6%)	

*****chi-square; significant when $p < 0.05$

It was found that the study populations are good in differentiating antibiotic with other drugs, 54.7% knew that penicillin is an antibiotic and 63.7% knows that antibiotic are not the same medication to relieve pain and fever. This is contrasted with studies in Penang and Putrajaya which the respondents are lacking in knowledge to differentiate between antibiotics and other commonly used medicines [8, 9]. This probably due to the factor that 74.7% of this population studied had the highest education level of university students and graduates.

A higher number of respondents, 63.2% have the knowledge that antibiotic the needs to complete the full course of antibiotic despite symptoms have been resolved as compared to studies in Hong Kong, 58% and Taiwan 50.1% [12, 14]. However, it is slightly low compared to studies in Penang with 71.1% [8]. The respondents also

know that if taking less antibiotic than prescribed is not healthier than taking the full course prescribed. The attitude of respondents has weak positive correlation with the knowledge (r=0.213, n=380, p<0.001) and there are only 57.9% of respondents‟ answer that they complete their antibiotic course. Thus our results suggest that although the respondents have a better knowledge, they did not necessarily practice it.

Table 5: Percentage of the answer based on knowledge statement

Statement	Correct answer n (%)	Incorrect answer n (%)	Not sure n (%)
Role of Antibiotic			
1. Antibiotic are medicine that can kill bacteria	305 (80.3%)	22 (5.8%)	53 (13.9%)
2. Antibiotic can be used to treat viral infection	150 (39.5%)	154 (40.5%)	76 (20%)
3. Antibiotic work on most cold and cough	91(23.9%)	200 (52.6%)	89 (23.4%)
Good Bacteria			
4. Antibiotic can kill bacteria that normally live on skin and gut	196 (51.6%)	54 (14.2%)	130 (34.2%)
5. Bacteria that normally live on the skin and in the gut are good for your health	177 (46.6%)	45 (11.8%)	158 (41.6%)
Identification of antibiotic			
6. Penicillin is an antibiotic	208 (54.7%)	38 (10%)	134 (35.3%)
7. Antibiotic are the medication used to relieve pain and fever	242 (63.7%)	85 (22.4%)	53 (13.9%)
Adverse effect			
8. Antibiotic may cause allergic reactions	277 (72.9%)	20 (5.3%)	83 (21.8%)
9. Antibiotic does not cause side effects	216 (56.8%)	60 (15.8%)	104 (27.4%)
10. Overuse of antibiotics can cause antibiotic to lose effectiveness in long term	218 (57.4%)	41 (10.8%)	121 (31.8%)
Administration of antibiotic			
11. It is okay to stop taking antibiotic when symptoms are improving	240 (63.2%)	92 (24.2%)	48 (12.6%)
12. Taking less antibiotic than prescribed is more healthy than taking the full course prescribed	244 (64.2%)	49 (12.9%)	87 (22.9%)

Table 6: Percentage of Answer Based on Attitude

Statement	Correct answer n (%)	Incorrect answer n (%)	Not sure n (%)
When I get a cold, I will take antibiotics to help me get better more quickly	161 (42.4%)	181 (47.6%)	38 (10%)
I expect antibiotics to be prescribed by my doctor if I suffer from common cold symptoms	118 (31%)	218 (57.4%)	44 (11.6%)
I normally stop taking an antibiotic when I start feeling better	220 (57.9%)	139 (36.6%)	21 (5.5%)
If my family member is sick I usually will give my antibiotic to them	258 (67.9%)	75 (19.7%)	47 (12.4%)
I normally keep antibiotic stock at home in case of emergency	238 (62.6%)	73 (19.2%)	69 (18.2%)
I will use leftover antibiotics for a respiratory illness	270 (71.1%)	43 (11.3%)	67 (17.6%)
I will take antibiotic according to the instruction on the label	333 (87.6%)	17 (4.5%)	30 (7.9%)
I normally will look at the expiry date of antibiotic before taking it	336 (88.4%)	23 (6.1%)	21 (5.5%)

4.3 Attitude towards antibiotic usage

In this research, it was observe that majority of respondents‟ answers correctly on the attitude statement. However, regarding the two statements from the survey, the respondents respond incorrectly. The statements are “when I get a cold, I will take antibiotics to help me get better quickly” with 57.6% (n=219) and “I expect antibiotic to be prescribed by my doctor if I suffer from

common cold symptoms", 69% (n=262). However the percentage of incorrect response for both of the statement is slightly low as compared to study done in Putrajaya. For the first statement, percentage of incorrect answer was 61.8% while second statement was 73.8%.

In Penang, for incorrect answer for first statement was 46.8% and second statement was 57.8%. This shows that in Penang, the public did not expect to be prescribed with antibiotic nor taken any antibiotic if they get symptoms of cold compared to in Shah Alam and Putrajaya.

32.1% of the respondents responded incorrectly regarding the attitude statement, „if my family member is sick, I usually give my antibiotic to them" which is comparatively high with study done in Penang 11.8% and Putrajaya 17.0%. This shows that although they have good knowledge of antibiotic but the respondents did not have a good attitude towards antibiotic.

Around 62.6% of respondents agree that they normally keep antibiotic stock at home in case of emergency. It is reported in Penang and Putrajaya to be low then this figure which is 80.1% and Putrajaya, 83%.

In this research also, the respondents who answered that they will use leftover of antibiotics for respiratory illness was high compared to Penang and Putrajaya. In this study, 28.9% respondents answer incorrectly and in Penang only 11.5% answer incorrectly. Putrajaya also shows a lower figure with 14.7%.

In current study87.6% of respondents claimed that they took antibiotic according to the instruction on the label while Penang with 93.1% and Putrajaya 96.5%. However for this survey, 7.9% answer that they are not sure if they took the antibiotic correctly. Thus, this study suggests that although the respondents have good knowledge of antibiotic, they did not show a very good attitude towards antibiotic and did not practice it in their life.

5 Conclusion

This study identified that knowledge of the respondents towards antibiotic in Shah Alam, Malaysia is good and they have a positive attitude towards antibiotic usage. However, it is shown that the attitude of the respondent is slightly low compared to other place in Malaysia such as Penang and Putrajaya. This showed that even though knowledge of respondents are good, some of them take usage of antibiotic for granted and feels that it is not important in their life. Future antibiotic awareness campaigns and patient counseling should promote the importance of the correct attitude on the usage of antibiotic. People should be exposed to the consequences of neglecting the importance of the correct usage of antibiotic such as the emergence of superbugs and also antibiotic resistance.

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7 Competing interests

The authors declare no competing interest, in part or whole. No funding was received for this study.

8 Author's contributions

MQ and NHSA carried out literature review and draft the manuscript. MQ andNHSA participated in collection of data and MQ, JK, AM and AA arranged in tabular form. All authors read and approved the final manuscript.

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