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Knowledge and Attitudes Regarding Antibiotic Use among Urban Community in Malaysia.

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ABSTRACT

This study examined the level of knowledge, attitude and the associated factors of antibiotic use among urban community in Malaysia. A cross sectional study conducted during the period from 02 June until 19 June 2014 at Shah Alam, Selangor, Malaysia. A systematic random sampling was used and a self-administered questionnaire in Malay language was used to collect the data. The questionnaire consists of three parts: socio-demographic, knowledge on antibiotic usage, attitude on antibiotic usage. The proposal of this study was approved by the Ethics Committee, Faculty of Medicine, UiTM, Malaysia. Data were and analyzed using Statistical Package for Social Sciences (SPSS for Windows version 20.0). A total of 450 respondent participated in this study with mean age 34.98 ±10.203. The majority of them female, Malay, with university educational and employed (55.3%, 85.3%, 58.2%, 53.6%; respectively). About 78.9% reported that antibiotics used to treatment bacterial infections. However, 52.9% reported that antibiotics used to treat viral infections. About 61.6% of the respondents were aware of antibiotic resistance phenomena in relation to overuse of antibiotics. About 35.1% believed that antibioticcould help cold symptoms to recover faster. Educational level, healthcare-related occupation and family's occupation related to healthcare were significantly associated with knowledge toward antibiotic use. Healthcare-related occupation, marital status and monthly income were significantly associated with attitude toward antibiotic use. In addition, there is moderate positive correlation between knowledge score and attitude score of the respondents ($p<0.001$) which means the increases in the knowledge score, the higher the attitude score. Healthcare-related occupation was significantly associated with both knowledge and attitude toward antibiotic use. Increases in the knowledge score, the higher the attitude score.

Keywords: Antibiotics usage, Urban community, Malaysia.

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INTRODUCTION

The emergence of the antibiotic resistance has become a threat to public health [1]. In 2001, The World Health Organization (WHO) issued a Global Strategy to overcome antibiotic resistance; in which they urged member countries to initiate awareness and educational campaigns for patients and general community on appropriate use of antibiotics [2].The misuse and overuse of antibiotics cause development of bacterial resistance [3].Worldwide, several studies reported that the inappropriate and extreme use of antibiotics is the main factor that causes the emergence of resistant bacteria. Thus, this issue becomes global public health challenging and concerned about patient-safety [3,4,5]. The inappropriate and extreme antibiotic use in several settings such as the community, primary health care, and hospitals may make a complex interaction between several factors such as: self-medication, physician's practices, and patients' knowledge about antibiotic use [6-7]. Therefore, integrated approach to control the antibiotic use is required good knowledge among consumers, pharmacists, health-care professionals, and health authorities. Few Malaysian studies investigate the knowledge and attitude towards antibiotic but no one conducted among urban community[11,12,13]. Therefore, improving the knowledge and changing the public attitude regarding antibiotics use will be an important early strategy to preserve antibiotic effectiveness in the era of resistance. Therefore, the objective of this study was to investigate the level of knowledge, attitudes, regarding antibiotics of the general population.

METHODOLOGY

A cross sectional was conducted among community of SubangBestari, Shah Alam, Selangor. The study was conducted during the period from 02 June until 19 June 2014. The study was conducted at Zon 18 SubangBestari, Shah Alam, Selangor, Malaysia. There are three types of housing area at SubangBestari which consist of 11 apartment (2491 houses), 7 terrace (1757 houses) and 2 village areas (859 houses). The population profile was obtained from the representative of of resident committee. SubangBestari was selected as the study site because it can be a representative of an urban area. According to the development of statistic Malaysia, an area with combined population of 10000 or more at a time or an area which at least had a population of 10000 with at least 60% of population involved in non- agricultural activities is defined as an urban area. The respondents included in our study were randomly selected based on the inclusion and exclusion criteria. Inclusion criteria were: Residents of SubangBestari, residents who are 18 years old and above, able to read and understand Malay language. Simple random sampling was applied to choose the respondents. We use simple random sampling so that all houses have equal chance of being selected. In order to set an equal chance for every respondent to be chosen, we used Research Randomizer software to draw the number of the houses to be selected. This shows the list of number of houses that has been selected randomly using the software. Subsequent houses were chosen if the selected house numbers were empty during data collection.

Sample size

The total number of population of SubangBestari, Shah Alam is 50,000. This number was obtained from the MPP Zon 18. We used calculator from Raosoft website to determine the sample size for our research based on the total number of population. By using the Raosoft sample size calculator, it was estimated that a minimum effective sample of 382 respondents should be sampled in order to gain a 95% confidence level, with a maximum acceptable difference of 0.05 (alpha (α) level) in detecting the study population. The calculation was based on normal distribution and assumption of more than 30 respondents we would be able to collect. A non-response rate of 20% was set from the 382 respondents that make a total of 459 respondents needed for this research. Out of 459 target respondents, we managed to get 450 respondents.

Instrument

A self- administered questionnaire was developed based on the literature to assess respondent's knowledge and attitude regarding usage of antibiotic. The questionnaire was designed in English initially and translated into Malay language for better understanding among the respondents of SubangBestari. Validation of the questionnaire was done by three senior lecturers of Public Health and Preventive Medicine (PHPM). The three lecturers involved in the validation of the questionnaire were from environmental health, statistics and epidemiology fields respectively. Based on feedbacks given, several modifications were done to improve and

finalized the questionnaire. A pilot study was also done with 50 respondents which involved the respondents outside the targeted population. Pre-testing questionnaires were done to test for the reliability of the questionnaire. The questionnaire consists of three parts and has a total of 47 questions. Part one is about socio-demographic which include age, gender, marital status, race, educational level, total household income per month, occupation, job related health care, family job related health care, health care location and co-morbidity. Part two is about knowledge on antibiotic usage which includes knowledge regarding source of antibiotic, reasons of taking antibiotic, function of antibiotic and identification of antibiotic. Part three is about attitude on antibiotic usage. This part consists of ten statements which tested on the attitude of respondents regarding on the usage of antibiotic. Statements were on respondent's belief, expectation, completion of treatment, sharing, extra supply, compliant to antibiotic, follow instruction, reading the expiry date before taking antibiotic, curiosity and idea. The proposal of this study was approved by the Ethics Committee, Faculty of Medicine, UiTM, Malaysia.

Data analysis

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS for Windows version 20.0). For scoring to evaluate the knowledge on antibiotic usage, one mark was awarded for each correct answer and zero mark was awarded for wrong and 'don't know' answers respectively. The maximum total score of knowledge was 26. Three categories of level of knowledge were scored by poor (0-8), moderate (9-17) and good (18-26) by arbitrary scoring according to Penang study to categorize the respondents. During inferential analysis, however, eventually to prevent discrimination that violate the Chi Square assumption (presence of 0 cells) occurring between groups, we simplify the analysis into two level of categorizes which were poor knowledge and good knowledge with mean of total score of knowledge (standard deviation) 13.23(5.09) as cut of point. In section assessing attitude of antibiotic usage (Part III), the questions regarding the attitude on antibiotic usage, we used five-level Likert scale scoring system. The maximum total score of attitude was 50. In order to label the population into appropriate (26 and above) and inappropriate (25 and below) were used to categorize attitude responses. However, during inferential analysis, with normally distributed attitude score, eventually to prevent discrimination that violate the Chi Square assumption (presence of 0 cells) occurring between groups, we simplify the analysis into two level of categorizes which were appropriate response and inappropriate response with mean of total score of attitude (standard deviation) 36.14(5.75) as cut of point. Therefore, score of 0-35 was awarded as inappropriate attitude response and 36 and above as appropriate response. In order to achieve the objectives, descriptive statistics as well as inferential studies were used. Qualitative variables were summarized and presented in frequency and percentages in tubular form. Quantitative variables were described by measurement of central tendency (mean, mode, median) and in form of graphical; histogram. In order to test association of socio-demographic details and knowledge and attitude, Chi square or Fishers Exact tests, independent t-test, ANOVA tests were applied wherever appropriate. In addition, correlation tests were also used to analyze the direction and degree of the relationship between knowledge and attitudes wherever applicable. In all statistical purposes, a p-value of < 0.05 was considered to be statistically significant.

RESULTS

A total of 450 respondents participated in this study. The mean age was 34.98 ±10.203 and the mean monthly household income was RM 4496.22±3911.508. The majority of the respondent was female (55.3%), Malay (85.3%) with university/college educational (58.2%), employed (53.6%). Most of the respondents had jobs which not related to healthcare with 91.3%. 63.3% of the respondent did not have family's job that related to healthcare. Regarding the location for seeking healthcare, most of the respondents went to private clinic with 56.2%. Only14% of the respondent had co-morbidities(Table 1).

Level of knowledge

Most of the participants (96.4%) reported that take antibiotic when prescribed by doctors only and reported that antibiotic cannot be buy at any clinic without doctor's prescription (66.2%). Regarding the reason of taking antibiotic, the respondents reported that fever was the first reason (85%), followed by respiratory illnesses (47.6%). The third reason was pain/inflammation (35.3%) followed by urinary tract infection (46.4%). The fifth reason was skin problem/wound (37.6%) and the sixth reason reported by the participants was stomach ache (17.3%).

Table 1: Socio-demographic characteristics of Subang Bestari community (n=450)

Variable	Frequency (%)
Gender	
Male	201(44.7)
Female	249(55.3)
Ethnicity	
Malay	384(85.3)
Chinese	35(7.80)
Indian	31(6.90)
Marital status	
Single	115(25.6)
Married	328(72.9)
Divorced	2(0.40)
Widow	5(1.10)
Educational level	
No formal education	4(0.90)
Primary school	16(3.60)
Secondary school	168(37.3)
University/college	262(58.2)
Occupation	
Employed	241(53.6)
Self-employed	62(13.8)
Pensioner	10(2.20)
Housewife	76(16.90)
Unemployed	4(0.90)
Student	57(12.7)
Job related to healthcare	
Yes (related)	39(8.70)
No (non-related)	411(91.3)
Family's job related to healthcare	
Yes (related)	165(36.7)
No (non-related)	285(63.3)
Locations seeking healthcare	
Private clinic	253(56.2)
Private hospital	31(6.90)
Government clinic	91(20.20)
Government hospital	67(14.90)
Pharmacy	4(0.90)
Others	4(0.90)
Co-morbidities	
Yes (present)	63(14.0)
No (absent)	387(86.0)

Regarding the role of antibiotic, the majority of the participants mentioned that antibiotics are medicine that can kill bacteria (78.9%), treat viral infections (52.9%), and treat fever (55.1%), relieve pain/ inflammation (30.9%). However, 15.8% mentioned that antibiotics can cure all illness.

Regarding the identification of antibiotics, 48% identified Penicillin as an antibiotic. However, 10%, 15.3% reported that Aspirin and Paracetamol are a new generation of antibiotics; respectively.

For the risk of antibiotics, 61.6% of the participants reported that overuse of antibiotics can cause antibiotic resistance and cause allergic reaction (53.1%). Moreover, 66.4% stated that the effectiveness of treatment is reduced if a full course of antibiotic is not completed (Table 2).

Attitude on antibiotic usage

Table 3 showed the proportion of responses for attitude statement regarding antibiotic usage. Majority of the respondent disagreed that antibiotic will make cold better more quickly (51.8%). The majority of the respondents agreed that they take the antibiotic according to the instruction on the label, agreed that they will look at the expiratory date of antibiotics before taking it (88.9%. 81.5%; respectively). 49.8% of the respondents agreed that they would stop taking antibiotic when they start feeling better. Majority of the respondents with 45.1% were unsure that they can help to prevent antibiotic resistance(Table 3).

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Table 2: Knowledge regarding antibiotic usage among urban community in Malaysia (n=450)

Statement	Yes N (%)	No N (%)	Don't know N (%)
Sources of antibiotic:			
I only take antibiotic when prescribed by doctors only	434(96.4)	13(2.9)	3(0.7)
Antibiotic can be buy at any clinic without doctor's prescription	56(12.4)	298(66.2)	96(21.3)
Antibiotic can be buy from any pharmacies	136(30.2)	206(45.8)	108(24.0)
Reasons of taking antibiotic:			
Fever	328(85)	85(18.9)	37(8.2)
Respiratory illnesses	214(47.6)	77(17.1)	159(35.3)
Pain/inflammation	159(35.3)	157(34.9)	134(29.8)
Urinary tract infection	209(46.4)	82(18.2)	159(35.3)
Skin problem/wound	169(37.6)	147(32.7)	134(29.8)
Stomach ache	78(17.3)	244(54.2)	128(28.4)
Role of Antibiotic:			
Antibiotics are medicines that can kill bacteria.	355(78.9)	30(6.7)	65(14.4)
Antibiotics can be used to treat viral infections.	238(52.9)	115(25.6)	97(21.6)
Antibiotics can cure all illness	71(15.8)	263(58.4)	116(25.8)
Antibiotics are indicated to relieve pain/ inflammation.	139(30.9)	181(40.2)	130(28.9)
Antibiotics are used to treat fever.	248(55.1)	134(29.8)	68(15.1)
Identification of Antibiotic:			
Penicillin is an antibiotic.	216(48.0)	43(9.6)	191(42.4)
Aspirin is a new generation of antibiotic.	45(10.0)	169(37.6)	236(52.4)
Paracetamol is considered as an antibiotic.	69(15.3)	274(60.9)	107(23.8)
Diphenhydramine (Syrup Benadryl) is not an antibiotic.	187(41.6)	121(26.9)	142(31.6)
Dangers of Antibiotic:			
Overuse of antibiotics can cause antibiotic resistance.	277(61.6)	35(7.8)	138(30.7)
Antibiotics may cause allergic reaction.	239(53.1)	52(11.6)	159(35.3)
All antibiotics do not cause side effects.	61(13.6)	209(46.4)	180(40.0)
Completion of Treatment Course:			
You can stop taking a full course of antibiotic if your symptoms are improving.	189(42.0)	227(50.4)	34(7.6)
The effectiveness of treatment is reduced if a full course of antibiotic is not completed.	299(66.4)	63(14.0)	88(19.6)
Doctor-patient's relationship:			
Doctor will spend time to give the information regarding antibiotic	253(56.2)	169(37.6)	28(6.2)
Pharmacist usually will give information regarding antibiotic	144(32.0)	214(47.6)	92(20.4)
I trust the antibiotic prescription given by the doctor	396(88.0)	38(8.4)	16(3.6)

Table 3: Attitude regarding antibiotic usage among urban community in Malaysia (n=450)

Statement	Disagree N (%)	Unsure N (%)	Agree N (%)
When I get a cold, I will take antibiotics to help me get better more quickly.	233(51.8)	59(13.1)	158(35.1)
I expect antibiotics to be prescribed by my doctor if I suffer from common cold symptoms.	200(44.5)	83(18.4)	167(37.1)
I normally stop taking antibiotics when I start feeling better.	197(43.8)	29(6.4)	224(49.8)
If my family member is sick, I usually will give my antibiotics to them.	313(69.6)	53(11.8)	84(18.6)
I normally keep antibiotics stocks at home in case of emergency.	321(71.3)	65(14.4)	64(14.3)
I will use leftover antibiotics for a respiratory illness.	308(68.4)	99(22.0)	43(9.6)
I will take antibiotics according to the instruction on the label.	27(6)	23(5.1)	400(88.9)
I normally will look at the expiry date of antibiotics before taking it.	44(9.8)	39(8.7)	367(81.5)
I am satisfied if the doctor prescribed antibiotic without giving the justification.	345(76.7)	50(11.1)	55(12.2)
I can help to prevent antibiotic resistance.	85(18.9)	203(45.1)	162(36)

Knowledge with socio-demographic characteristics

There is a significant difference between mean total score of knowledge regarding antibiotic usage between low and high education. Therefore, respondents with high education have a significantly higher mean total score of knowledge on antibiotic usage compared to those with low education. There is a significant difference between mean total score of knowledge regarding antibiotic usage between job related to healthcare and job non-related to health care. Therefore, respondents who works in healthcare has a significantly higher mean total score of knowledge regarding antibiotics usage compared to those who do not work in healthcare. Therefore, the difference between mean total score of knowledge regarding antibiotic usage between family's job related and family's job non - related to health care was statistically significant (p=0.005). respondents who have family members who work in healthcare has a higher mean total score of knowledge regarding antibiotics usage compared to respondents who do not have family members who work in healthcare(Table 4).

Table 4: Summary of mean total score of knowledge regarding antibiotic usage with socio-demographic characteristics among Subang Bestari community (n= 450)

Variable	Mean(SD)	T	*p*-Value
Gender -Male -Female	13.10(5.135) 13.77(5.117)	-1.335	0.182
Marital status -Married -Unmarried	13.63(4.994) 13.04(5.486)	-1.041	0.298
Race -Malay -Non-Malay	13.56(5.207) 12.95(4.646)	0.857	0.392
Educational level -High -Low	14.72(5.062) 11.71(4.701)	-6.230	0.000
Occupation -Employed -Unemployed	13.69(5.188) 13.00(4.989)	1.301	0.194
Healthcare-related occupation -Yes -No	15.79(5.987) 13.24(4.989)	2.944	0.003
Family 's occupation related to healthcare -Yes -No	14.59(5.003) 12.81(5.099)	3.495	0.001
Healthcare location -Government -Non-government	12.88(5.626) 13.80(4.812)	-1.773	0.077
Co-morbidity -Yes -No	13.61(5.048) 13.45(5.150)	0.234	0.815

Attitude

Therefore, the difference of mean total score of attitude between Health care related occupation regarding antibiotic usage was statically significant (p=0.024). We conclude that there is significant difference between mean of total score of attitude of antibiotic usage in healthcare-related occupation and non-healthcare-related occupation.

That mean total of attitude of married population significantly higher than single population. We observe that higher total score of attitude results among population who are married as compared to those single(Table 5).

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Table 5: Association between other socio-demographic details with mean total score of attitude regarding antibiotic usage

Variable	Mean(SD)	T	(df)	*p*-Value
Gender Male Female	 35.55(5.82) 36.62(5.66)	-1.972	(448)	0.049
Health care related occupation Yes No	 38.13(6.26) 35.95(5.67)	2.271	(448)	0.024
Race Malay Non-Malay	36.33(5.827) 35.03(5.159)	1.702	(448)	0.09
Educational level Low (none/primary/secondary) High (college & university)	 35.73(5.71) 36.43(5.77)	-1.27	(448)	0.205
Occupation working not working	35.99(5.961) 36.46(5.285)	-0.812	(448)	0.417
Family related healthcare Yes No	36.62(6.006) 35.86(5.583)	1.361	(448)	0.174
Healthcare location government non-government	36.06(5.874) 36.18(5.687)	-0.225	(448)	0.822
Comorbidity Yes No	35.75(5.536) 36.20(5.785)	-0.586	- (448)	0.558
Variable	**Mean(SD)**	**F**	**(df)**	***p*-Value**
Marital Status Single Married Divorce Widowed	 34.07(5.539) 36.86(5.686) 33.00(1.414) 37.60(3.975)	7.306	 (3.449)	*p<0.001*

There is significant association between level of knowledge and total household income regarding antibiotic usage. In addition to that there is significant higher proportion of knowledge regarding antibiotic usage in middle household income as compared to other household income(Table 6).

Table 6: Association between level of knowledge and total household income regarding antibiotics usage

Total Household income	Level of Knowledge		Chi Square value (df)	*p*-value
	Poor n(%)	Good n(%)		
Poor	**45(28.7)**	**112(71.3)**	**16.486 (2)**	**0.000**
Middle	**40(16.0)**	**210(84.0)**		
High	**2(4.7)**	**41(95.3)**		

Figure 1 explains the relationship between total score of knowledge and total score of attitude regarding antibiotics usage. There is significant correlation between total score of knowledge and total score of attitude. Moreover, there is moderate, positive correlation between the total score of knowledge and total score of attitude.Increase in total score of knowledge of respondents is related to increase of total score of attitude of respondents towards antibiotics usage.

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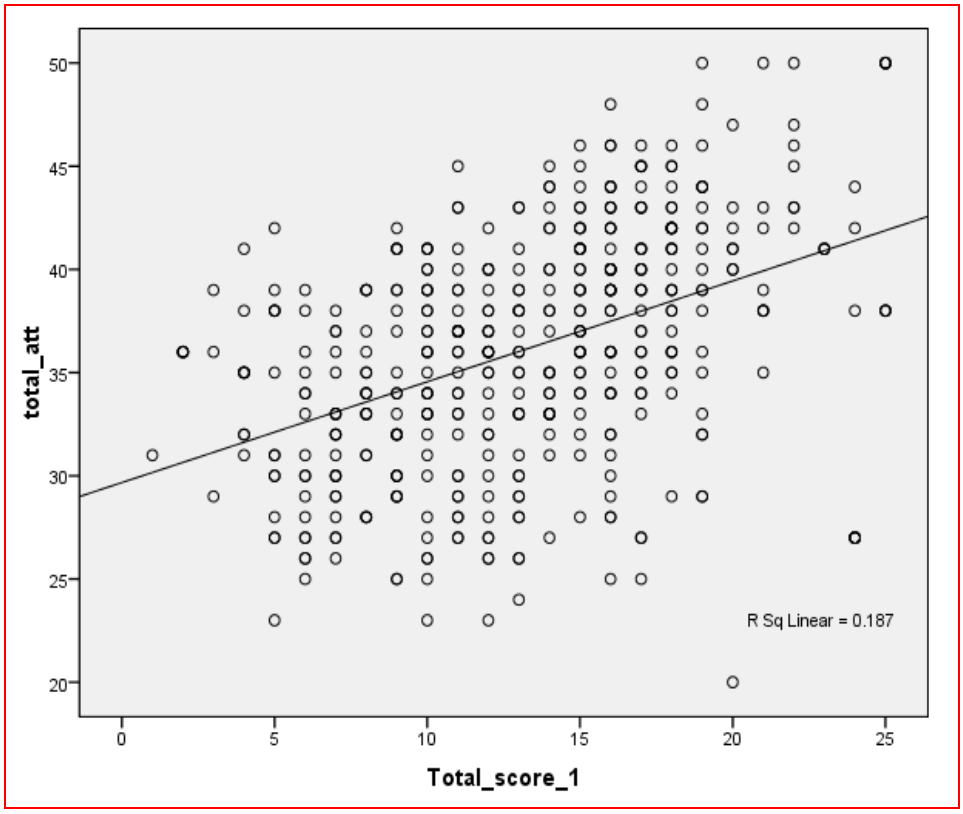

r: 0.4333, p-value: 0.000

Figure 1: Scatter plot of Total Score of Knowledge vs total score of attitude, n=450

DISCUSSION

Studies concerning knowledge of antibiotic usage among general community in Malaysia are still limited. In this study, we found that the SubangBestari population has a moderate knowledge on antibiotic usage ($p<0.001$) which accounts for 60.2% of the population which is higher compared to a study done in Penang (54.7%). [13]

Respondents were tested on their knowledge on the source of getting antibiotic. Majority (96.4%) knows that they can only get antibiotic by the prescription from the doctor. However, there are still quite a number of the population (12.4%) who thinks that antibiotic can be purchased without prescription from the doctor meaning that the information on this important thing about drug prescription has still not reach to a few amount of this urban population. It has been reported locally and in other countries that there was a possibility that people could obtain antibiotics without a medical prescription even though this practice was illegal. For example, a similar study in cheras has shown that, 20.4% has obtained antibiotic without prescription, 7.6% in Penang and 4.5% in Putrajaya and 9% in Hong Kong [8, 11-13].

In terms of indication of antibiotic, almost all of the population thinks that fever (85%) and respiratory illnesses (47.6%) are one of the indication. As compared to a study in Penang and a study in Putrajaya, fever (40.7%, 29.1% respectively) and respiratory illness (22.9%, 31.4% respectively) are remained as the main reason of taking antibiotic as similar in this study [11, 13]. Otherwise most of SubangBestari residence gets the right answer for the indication of antibiotics, which are respiratory infection, urinary tract infection and skin infection.

Regarding the role of antibiotics, 78.9% of the respondents know that antibiotics are effective for bacterial infections. However there was some misconception among public regarding whether antibiotics are effective against bacteria or viruses. This could be due to the term “germ”, which was commonly used during counseling to the public/patients instead of using the microbiological term “bacteria” or “virus” [11]. Quite a high percentage of respondents who had answered incorrectly and do not know about role of antibiotic in

treating viral illness (74.5%) which is comparable to Penang study (86.6%) and Putrajaya (83%) [11, 13]. In terms of identification of types of antibiotics, most of the respondents had inadequate knowledge to differentiate between antibiotics and over-the-counter medications. There are a few factors that possibly related to these issues according to Penang study: not used to generic name of the medications, had no idea about these medicines, hardly noticed the names of the medicines that they were taking, as well as lack of information provided by the health-care providers. Only 61.6% of the respondents are aware of the antibiotic resistance as comparable to Putrajaya (67.8%), Penang (59%), Cheras (52.4%) and Hong Kong (79%), however quite a large amount of the respondents did not know about it (138, 30.7%) [11, 13].Although majority has agreed that antibiotic administration can cause allergy and side effect, but quite a number of respondents still did not know about its dangers on allergy and side effect (35.3% and 40% respectively).

About half (50.4%) of the respondents from SubangBestari knew that they have to complete the full course of antibiotic which is about the same with the finding from a study in Cheras(49.6%) [12]. The result is quite low when we compare it to other studies such as done in Penang (71.1%),

Hong Kong (62.9%), Putrajaya (58.1%) and Sweden, which was the highest (95.5%) [10-13]. Respondents were also tested on their knowledge regarding doctor-patient relationship. Majority of the respondent, believe on the prescription given by the doctor (88%). Only 56.2% of the respondent agrees that information of antibiotic usage was given by the doctor. This study has found that, those with higher education and higher monthly income has significant association with higher knowledge (both $p<0.001$), the same as the study done in Penang [13]. The study in Putrajaya also shows that education has significantly associated with knowledge of antibiotic usage [11].

Current study also shows that those who work in a healthcare field and whose family's occupation is related to healthcare has significantly associated with higher knowledge ($p=0.003$,0.001 respectively). In Penang, those whose occupation is related to the healthcare also met the significant difference but not the family occupation on healthcare [13].

Studies concerning attitude regarding antibiotic usage among general community in Malaysia is still inadequate. From our study, we found that SubangBestari community has an appropriate attitude regarding antibiotic usage ($p<0.001$) which is comparable to a study done in Penang [13].

In this study, 35.1% of the respondents in SubangBestari prefer to take antibiotic when they suffered from a cold which comparable with Penang study (38%) [13]. However, this finding is higher compared to those reported in Hong Kong (17%) and South Korea (30%) [8, 16].

The habit of prescription of antibiotics for viral respiratory infection has influenced public perception that it is effective in treating these illnesses although it is self-limiting disease [20]. This is a wrong practice because approximately 90% of all upper respiratory tract infection cases usually caused by viruses which do not respond to antibiotic treatment and subsequently can predispose to antibiotic resistance [21].

In view of public misconceptions regarding antibiotic usage unfortunately contributed to the high expectation of antibiotic treatment for the common cold among the public. From our study, about 37.1% of the respondents were expecting doctors to prescribe them with antibiotic when they get colds. However in Penang and US it was reported to be higher (47.3%) and (48%) respectively but lower percentages were reported from other similar studies [5, 13, 14, 22].

In our study, about 49.8% of the respondents agree that they will stop taking antibiotic when they feel better. However lower percentages was reported in Penang study (37%) but higher percentages in South Korea (77.6%) [5, 16].

Antibiotic sharing was assessed in our study which shows 69.6% of the respondents disagree to share the antibiotic (i.e sharing to their family if anyone of them sick). This is an appropriate attitude in which they should not share the antibiotic to avoid the resistance issue. According to Penang study, 88.2% of the respondents showed appropriate response regarding this issue which indicate good attitude responses [5]. However 18.6% of our respondents would agree to share the antibiotic with other people and this is an

inappropriate response that we need to highlight in the community. Antibiotic sharing was also reported to be common in other studies such as Nigeria and Saudi Arabia (48% and 57.2% respectively [23-24].

Besides, most of our respondents showed appropriate attitude whereby 71.3% of them disagree to keep the antibiotic storage at home for future usage. This is comparable with Penang study in which 80.1% of them disagree to keep the antibiotic at home [5]. In addition, the leftover antibiotic was never thought to be used for respiratory infections. In this study, 68.4% disagree to use leftover antibiotic for respiratory infections which posed an appropriate attitude of antibiotic. Many of the respondents (88.9%) have appropriate attitude to read instructions labeled on packaging of medicine before consuming them. About 81.5% commonly check the expiry date of antibiotics every time they were prescribed for it. The Nigerian study and Penang study are relatively comparable with 93.3% and 92.2% respectively regarding this matter [5, 23]. This may also due to blooming of illegal medications nowadays [25].

About 76.7% of the respondents will not be satisfied if the physician does not allocating time to explain the reasons for them taking the antibiotics. Physician-patient rapport is very important to prevent misconception regarding antibiotic therapy issues nowadays. There must be clear line existing between patient's safety and profitable business before prescribing antibiotics although patient's demands are profitable [26]. Besides, about 45.1% of the respondents were unsure if they could help in preventing antibiotic resistance, meanwhile 36% has appropriate response to prevent antibiotic resistance. There are many efforts must be taken in order to educate 'unsure' group of respondents. The previous study reported lack of awareness among public that they could help to prevent antibiotic resistance [27].

From current study, older age, female genders, healthcare-related occupation, were significantly associated with the respondent's attitude. This is comparable with the study in Penang in which they found younger age (between age of 18-30) was significantly associated with inappropriate attitudes towards antibiotic usage [5]. In addition, Putrajaya study reported in 2012 had some comparable findings in which they found that older age, female gender and healthcare related occupation contributed to a significant association with appropriate attitude response on antibiotic usage [11]. Besides, a study conducted in Hong Kong in 2007, female gender and also contribute to significant association with the appropriate response [8]. Our study also found married people and higher in household income group significantly associated with attitude on antibiotic usage. None of local studies were reported to have significant association among married people and higher in household income group with attitude on antibiotic usage [5, 11]. Our study also found a moderate, positive correlation between the total score of knowledge and total score of attitude. This is consistent with the Putrajaya study in which they found out a positive correlation between respondent's knowledge of appropriate antibiotic usage with attitude [11]. Other comparable study with our finding is the study in South Korea in which they found an adequate knowledge of antibiotics to be a predictor for appropriate attitudes towards antibiotic usage [16].

CONCLUSIONS

Majority of participants in this urban Malaysia area have moderate level of knowledge and appropriate attitudes for antibiotic usage. The associated factors contributing to the knowledge of antibiotics usage are higher education level, higher household income, healthcare-related occupation, family's occupation related to healthcare and those who seek healthcare services from non-governmental institution. The associated factors contributing to the attitude of antibiotics usage are female gender, older age, married people, healthcare-related occupation, and higher household income. In addition, study found moderate positive correlation between knowledge and attitude of the respondents toward antibiotics usage. A program could be conducted as an initial step to promote better understanding of antibiotics and should be extended to larger scale educational campaigns on antibiotics, in view of the knowledge inadequacy and inappropriate attitudes toward antibiotic usage noted among the general public in this study.

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