UNIVERSITI PUTRA MALAYSIA

ASSESSMENT OF SCHOOL ZOONOTIC DISEASES AWARENESS PROGRAM AMONG PRIMARY SCHOOL STUDENTS OF SEKOLAH KEBANGSAAN SERI SELANGOR USJ4, SUBANG JAYA SELANGOR.

HAZLINI SHAFIE

ASSESSMENT OF SCHOOL ZOONOTIC DISEASES AWARENESS PROGRAM AMONG PRIMARY SCHOOL STUDENTS OF SEKOLAH KEBANGSAAN SERI SELANGOR USJ4, SUBANG JAYA SELANGOR.

HAZLINI SHAFIE

A project paper submitted to the

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In partial fulfillment of the requirement for the

DEGREE OF DOCTOR OF VETERINARY MEDICINE

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CERTIFICATION

It is hereby declared that we have read this project paper entitled "Assessment of school zoonotic disease awareness program among primary school students of Sekolah Kebangsaan Seri Selangor USJ4, Subang Jaya, Selangor", by Hazlini Binti Shafie and in our opinion it is satisfactory in term of scope, quality, and presentation as partial fulfillment of the requirement for the course VPD 4999 – Project.

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DEDICATIONS

In the name of Allah, The Most Almighty and The Most Merciful

Special dedication and appreciation I give to...

My beloved parent, Ma and Ayah, who always pray for my success

Gayah Binti Che Deris

Shafie Bin Jusoh

My supportive and loving siblings

Salwani Shafie

Ridzuan Shafie

Muhammad Faizal Shafie

Hazlina Shafie

Shafiqa Izlyn Shafie

Shafiq Haiqal Shafie

And to all my teachers and lecturers who have committed themselves toward the noble cause of education.

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First and foremost, I would like to thank Allah swt for giving me a chance to finish my final year project successfully.

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ABSTRACT

An abstract of the project paper presented to the Faculty of Veterinary Medicine in partial fulfillment of the course VPD 4999 – Project.

ASSESSMENT OF SCHOOL ZOONOTIC DISEASES AWARENESS PROGRAM AMONG PRIMARY SCHOOL STUDENTS OF SEKOLAH KEBANGSAAN SERI SELANGOR USJ4, SUBANG JAYA SELANGOR.

By

Hazlini Shafie

2017

Supervisor: Dr. Nur Indah Ahmad

Co-supervisor: Dr. Mohd Mokrish Md. Ajat

Humans are prone to be infected with zoonotic diseases from wildlife/domestic animals and the environment. It is important for public especially school students to be aware of zoonotic diseases in order to prevent zoonotic disease transmission when handling animals. Thus, this study was carried out to determine the awareness on zoonotic diseases among primary school students of Sekolah Kebangsaan Seri Selangor USJ4, Subang Jaya, Selangor before and after the school zoonotic diseases awareness program and as well as to assess the effectiveness of the program in educating students on zoonotic diseases . The awareness program conducted consists of eight modules and each module comprises of a few activities related zoonotic diseases education for school students. The program was divided into two phases, first phase was conducted on the 5th October 2016 at the school followed by the

second phase on the 10th October 2016 in UPM. A set of questionnaire on zoonotic diseases was designed to assess the awareness and knowledge of students on zoonotic diseases. The questionnaires (pre-survey forms) were distributed among the students to be answered before the students were introduced to the zoonotic diseases topics in the awareness program and the questionnaires (post-survey forms) which consist of the same questions as in pre-survey forms were distributed again after the the school zoonotic diseases awareness program and activities finished. A total of 40 respondents were obtained. Mann Whitney U-Test was used to analyze the data by each question. Significant difference ($P<0.05$) in awareness on zoonotic diseases by each question was observed among primary school students of Sekolah Kebangsaan Seri Selangor, USJ4 between before and after the awareness program. (89.1%) from 35 total of questions had significant difference ($P<0.05$) in awareness on zoonotic diseases between before and after the progrom was conducted. Thus, we can conclude that the program was effective and the students acquired basic knowledge on zoonoses and ways to prevent transmission after participating in the school zoonotic diseases awareness program.

Keywords: Zoonotic diseases, education, awareness program, primary school students, transmission

ABSTRAK

Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999 – Projek.

PENILAIAN PROGRAM KESEDARAN SEKOLAH TERHADAP PENYAKIT ZOONOTIK DALAM KALANGAN PELAJAR SEKOLAH RENDAH DI SEKOLAH KEBANGSAAN SERI SELANGOR USJ4, SUBANG JAYA SELANGOR.

Oleh

Hazlini Shafie

2017

Penyelia: Dr. Nur Indah Ahmad

Penyelia bersama: Dr. Mohd Mokrish Md. Ajat

Manusia cenderung untuk dijangkiti penyakit zoonotik dari hidupan liar haiwan / domestik dan alam sekitar. Adalah penting untuk orang ramai terutamanya pelajar sekolah untuk menyedari penyakit zoonotik untuk mengelakkan jangkitan penyakit zoonotik apabila mengendalikan haiwan. Oleh itu, kajian ini dijalankan untuk menentukan kesedaran mengenai penyakit zoonotik di kalangan pelajar sekolah rendah di Sekolah Kebangsaan Seri Selangor USJ4, Subang Jaya, Selangor sebelum dan selepas program kesedaran terhadap penyakit zoonotik dan juga untuk menilai keberkesanan program dalam mendidik pelajar mengenai penyakit zoonotik. Program kesedaran yang dijalankan terdiri daripada lapan modul dan setiap modul

terdiri daripada beberapa aktiviti yang berkaitan pendidikan terhadap penyakit zoonotik untuk pelajar sekolah. Program ini telah dibahagikan kepada dua fasa, fasa pertama telah dijalankan pada 5 Oktober 2016 di sekolah diikuti dengan fasa kedua pada hari pada 10 Oktober 2016 di UPM. Satu set soal selidik mengenai penyakit zoonotik telah direka untuk menilai kesedaran dan pengetahuan pelajar mengenai penyakit zoonotik. Borang soal selidik (borang sebelum survey) telah diedarkan di kalangan pelajar untuk dijawab sebelum pelajar telah diperkenalkan kepada penyakit zoonotik topik dalam program kesedaran sekolah dan borang soal selidik (borang selepas survey) yang terdiri daripada soalan-soalan yang sama seperti dalam pra-borang kaji selidik telah diedarkan semula selepas program kesedaran penyakit zoonotik sekolah dan aktiviti selesai. Seramai 40 orang responden telah diperolehi. Mann Whitney U-Test digunakan untuk menganalisis data untuk setiap soalan. Perbezaan yang signifikan ($P < 0.05$) dalam kesedaran mengenai penyakit zoonotik dengan setiap soalan diperhatikan di kalangan pelajar sekolah rendah di Sekolah Kebangsaan Seri Selangor, USJ4 sebelum dan selepas program kesedaran ini. (89.1%) daripada 35 jumlah soalan mempunyai perbezaan yang signifikan ($P < 0.05$) dalam kesedaran mengenai penyakit zoonotik antara sebelum dan selepas progrom itu dijalankan, dengan itu kita boleh membuat kesimpulan bahawa program ini berkesan dan para pelajar memperoleh pengetahuan asas mengenai zoonosis dan cara-cara untuk menghalang penghantaran selepas menyertai program kesedaran sekolah terhadap penyakit zonootik.

Kata kunci: penyakit zoonotik, pendidikan, program kesedaran, pelajar sekolah rendah, penghantaran

1.0 INTRODUCTION

Zoonoses are diseases that are naturally transmitted between animals and humans. In Tanzania, research has shown that several zoonoses, including brucellosis, leptospirosis, and Q fever, are common, but under-diagnosed, causes of human illness (Zhang *et al*., 2016). Zoonoses constitute a diverse group of viral, bacterial, rickettsial, fungal, parasitic, and prion diseases with a variety of animals reservoirs, including wildlifes, livestocks, pet animals, and birds (Nkuchia *et al*.,2007). In most cases, animals play an essential role in maintaining the infection in nature and contribute in varying degrees to the distribution and actual transmission of infection in human and animal populations. These diseases have a variety of transmission mechanisms that may be direct such as in rabies and anthrax, or indirect, via vectors, food, water and the environment, as in the case of bovine tuberculosis and cysticercosis. Many, such as brucellosis, also have multiple routes of infection. With the constant and inevitable interaction of man and animals, zoonotic diseases remain a genuine threat to health and survival for people, their livestock, companion animals and wildlife (WHO, 2005). Among the many zoonotic diseases prevalent in Malaysia are leptospirosis, rabies, influenza, Japanese encephalitis, toxoplasmosis, ornithosis, Q fever and monkeypox which have been investigated at the Division of Virus Research, lnstitute for Medical Research, Kuala Lumpur (Tan, 1981).

The perception of the community towards zoonotic diseases plays an important role for the maintenance of life cycle and transmission of these diseases to the different arrays of their hosts. Studying the perception of the community on the risk

factors, routes of transmission and life cycle of zoonotic diseases is a crucial step towards the development and implementation of appropriate disease prevention and control strategies (Tesfaye *et al.,* 2013). Majority elementary and high school students receive the informations on zoonotic diseases from their families in the form of advice while most health professionals receive their informations from medical schools they have attended which justifies that health professionals have better awareness about zoonotic diseases. It is shown that health professionals have better know how as compared to non health professionals and students' response is used to access information about what families of school aged children (Girma *et al.,* 2012).

Few studies have been done on zoonotic diseases in Malaysia. The studies include leptospirosis, an emerging zoonotic disease in Malaysia (Thaya *et al.,* 2013), some zoonotic diseases prevalent in Malaysia (Tan, 1981) and zoonotic malaria in Malaysia (Lim, 2013). However, there was no published study on zoonotic diseases awareness in Malaysia especially among primary school students. Thus, this study was conducted to assess awareness on zoonotic disease among primary school students of Sekolah Kebangsaan Seri Selangor USJ4, Subang Jaya, Selangor by focusing on the development of the best methods to educate the students about the zoonotic diseases so that they have better understanding on the preventation of exposure to zoonotic diseases through school zoonotic diseases awareness program that comprise of few modules that students would involve in.

The objectives of this study were:

1. To determine awareness on zoonotic diseases among primary school students of Sekolah Kebangsaan Seri Selangor USJ4, Subang Jaya, Selangor before and after the conduct of the awareness program.
2. To assess the effectiveness of the school zoonotic diseases awareness program.

2.0 LITERATURE REVIEW

2.1 Definition of zoonotic diseases and their mode of transmission

Any disease or infection that is naturally transmissible from vertebrate animals to humans and vice-versa is classified as a zoonosis according to the PAHO publication "Zoonoses and communicable diseases common to man and animals". Zoonoses have been recognized for many centuries, and over 200 have been described. They are caused by all types of pathogenic agents, including bacteria, parasites, fungi, and viruses (WHO, 2013). There are different types of zoonotic diseases like Rabies, blastomyosis, psittacosis, trichosis, coccidomyosis and etc. These zoonotic diseases can be transmitted to humans in many ways like animal bites and scratches, food animals, farmers and veterinarians, vectors like mosquitoes, tick, fleas, and lices (Durga, 2016).

2.2 Source of information about the zoonotic diseases

Based on study of assessment of awareness on food borne zoonosis and its relation with Veterinary Public Health Services in and around Addis Ababa, Ethiopia by (Girma *et al.,* 2012) reported that students, graduates, health and non health professionals get information about zoonotic diseases and veterinary public health services from different sources such as mass media, electronic media, school and others. This study reported that majority (85.42%) of the students get the information from other information sources like their families in the form of advice and 67.71% of health professionals get from schools they have attended during their medical education.

2.3 Relationshiop between education level and zoonotic diseases awareness

In the present investigation the overall percentage of awareness and practices with respect to zoonotic diseases was not satisfactorily but differed significantly between respondents'educational level and experience. Though farmers and agricultural workers with primary level of education and above that and the other categories of respondents with different levels of education, no difference was observed among them with regarding the awareness about zoonotic diseases. This observation reflects the source of information about zoonotic diseases where non formal education through extension workers and information through news papers and television were mentioned as important source of information on zoonoses (Babu *et al,.* 2015).

Continued education and awareness bringing programs and collaboration between veterinary and human health care professionals were considered to be important to bring awareness among the public about zoonotic diseases and to combat those diseases. Therefore efforts by both veterinary and human health care professionals should focus on effective ways of improving public knowledge of zoonotic diseases and their transmission, the development of improved herd disease management plans and the establishment of food safety systems (Masavkar *et al,.* 2016).

3.0 MATERIALS AND METHODS

3.1 The questionnaire

The questionnaire was designed to assess the awareness and knowledge of students on zoonotic diseases. The questions were presented in a five-point Likert scale ranging from "Strongly disagree = 1" to "Strongly agree = 5" An example of questionnaire as in appendix 1.

Basically, there were six sections in the questionnaire as follow:

1. Section A: About health and diseases
2. Section B: About pets
3. Section C: About petting farm, zoos and stray animals
4. Section D: About feelings, interactions and perceptions toward animals
5. Section E: About food safety and personal hygiene
6. Section F: General

3.2 School zoonotic diseases awareness program

A total number of 40 standard 6 students from Sekolah Kebangsaan Seri Selangor was assessed in this study. They consist of 22 female and 18 male from a multiracial backgrounds. The school zoonotic diseases awareness program was divided into two phases, first phase was conducted on the 5th October 2016 at the school as in appendix 2 followed by the second phase on the 10th October 2016 in UPM as in appendix 3. The program conducted consist of eight modules and each module comprises of a few activities related zoonotic diseases education for school students. Basically the activities

conducted at the school were based on Module 1, Module 2, Module 3 and Module 4 while in UPM, activities conducted based on Module 5, Module 6, Module 7 and Module 8. A set of questionnaire on zoonotic diseases was designed to assess the awareness and knowledge of students on zoonotic diseases. The questionnaires (pre-survey forms) were distributed among the students to be answered before the students were introduced to the zoonotic diseases topics in the awareness program and the questionnaires (post-survey forms) which consist of the same questions as in pre-survey forms were distributed again after the awareness program finished. Same respondents were used for pre and post survey. The tentative of the program for both days as in appendix 4.

3.2.1 Module 1: Introduction To UPM-VET And What Is A Vet Doctor

The objectives of Module 1 was to introduce to the students about UPM and Faculty of Veterinary Medicine and also the veterinarian profession. Basically, in Module 1, the students had been introduced about UPM and veterinarian profession by the slide presentation about doctor of veterinary medicine and video play on University Putra Malaysia's Corporate video. Through Module 1, the students would be able to understand better about the veterinarian profession.

3.2.2 Module 2: Ice breaking session

The objectives of Module 2 were to divide the students into smaller group so that they get to know members of the group and also to introduce the facilitator to them. The activity in Module 2 was the students were divided into eight groups comprising of 4-5 student for each group by the number roll call from 1-8. One facilitators was assigned for each group .The facilitators consist of lecturers and post graduate students from UPM. The students had been asked to write their name on nametag and paste on their t-shirt and same thing for the facilitator too. The students had answered the questionnaires (pre-survey form) in this session and facilitators would assist or clarify the questions to ensure them understand questions that were asked.

3.2.3 Module 3: What is a pathogen ?

The objective of Module 3 was to introduce to the students about the different types of pathogens available around us such as bacteria, virus, and parasites. The Module 3 was adapted from "What is a Pathogen" from Machigan State University. Basically, the activities in Module 3 had 3 sections which were bacteria section, virus section and parasites section where the students need to construct three types of bacteria,virus and parasite to observe and determine the differences between the three main types of disease agents by using materials given as follow:

Bacteria section: Modeling clay, pipe cleaners, cotton balls, writing utensils or sticks, double-sided tape/photo squares.

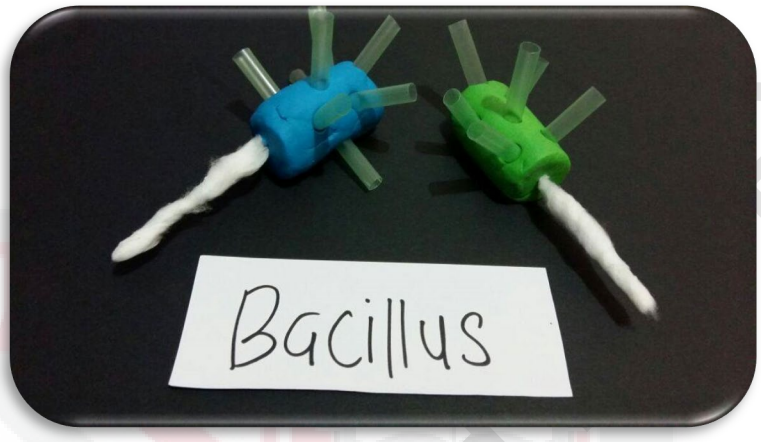
Virus section: Balloons, beans, cotton balls, coffee stir straws, double-sided tape/photo squares.

Parasites section: Modeling clay.

Before begin the activity, the facilitators had described to the students the different types of pathogens available in nature by using pictures as guide to explain. The students would work as a group.

In bacteria section, each group had given 2 minutes to create what they believed a bacterium would look like when the facilitators gave the signal or clues. The facilitators would give a signal by read aloud the instruction. For example, to construct first bacteria that was rod-shaped bacteria, the students need to use the pieces of pipe cleaner and stick them into the two clay logs so they stick out like antennas over the bacterium. They had created the hair-like projections. At the same time, the facilitators explained to the students on how the bacterium reproduce by splitting the clay model into half where the bacterium create a copy of themselves and asked the students to use materials given such as the shortest pipe cleaners represent "pili," small hair-like extensions that help bacteria adhere to cells. The longer pipe cleaner pieces represent "flagella," which help bacteria to move. Facilitators would tell the students not all rod shaped bacteria have pili or flagella, but some have pili or flagella, or both and examples of rod-shaped bacteria are *Salmonella* and *E.Coli.*

They had successfully made their first type of bacteria. Picture below represents the model of rod-shaped bacteria:

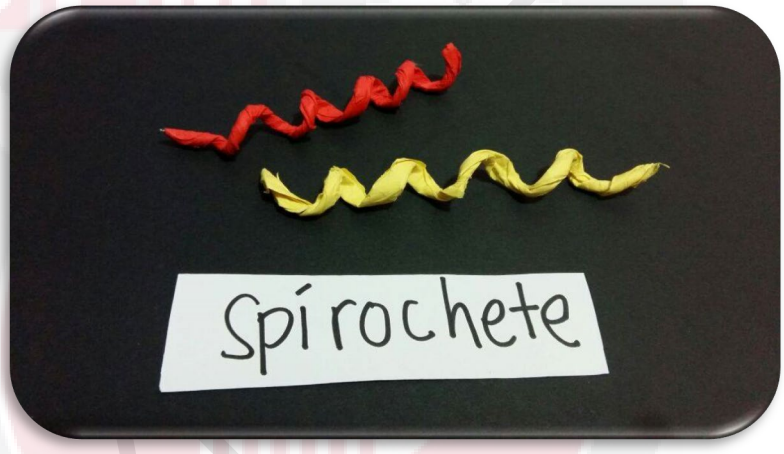


Moving on for second bacteria, the students need to construct cocci bacteria where they need to use cotton balls and doublesided tape/photo squares and use the tape/photo squares to stick the cotton balls together into any formation they wanted. Picture below represents the model of cocci bacteria:

At the same time, the facilitators would explain to the students about the cocci bacteria where these bacteria are round like a ball, but they often like to cluster into interesting shapes. An example of this kind of bacteria is *Mycoplasma,*

which infects pigs and poultry. *Mycoplasma gallisepticum* in chickens often causes respiratory disease symptoms such as coughing and difficulty breathing.

The third bacteria, the students need to construct a spirochete bacterium by taking the single full-length pipe cleaner and wrap it around the pencil then slide the pipe cleaner off of the pencil. Picture below represents a spirochete bacterium:

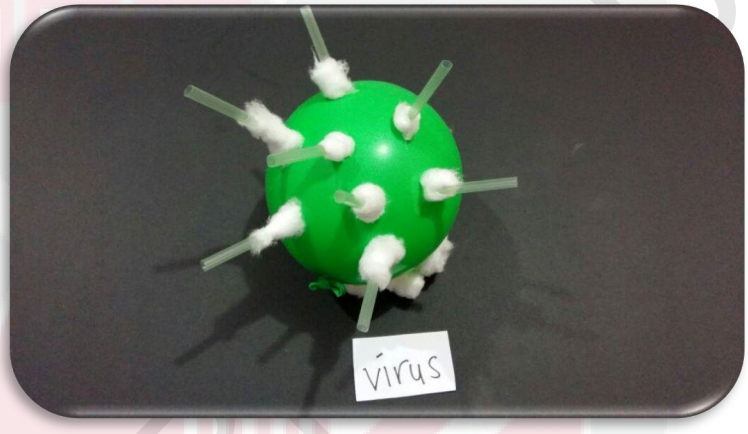


It is long, can coil and tends to be flexible. This is another commonly found shape of bacteria. *Borrelia burgdorferi* is one of the largest concerns as it causes Lyme disease.

Next, the students would move on to the virus section. Before begin the activity, the facililator would ask the students what they understand about the virus. The facilitators would tell the students that they would use the balloon to represents the outer membrane of the virus. The beans that they put on the inside are its genetic material (DNA or RNA) that's what it gives to the cell so the cell has a blueprint for making more viruses. The cotton balls and cotton-

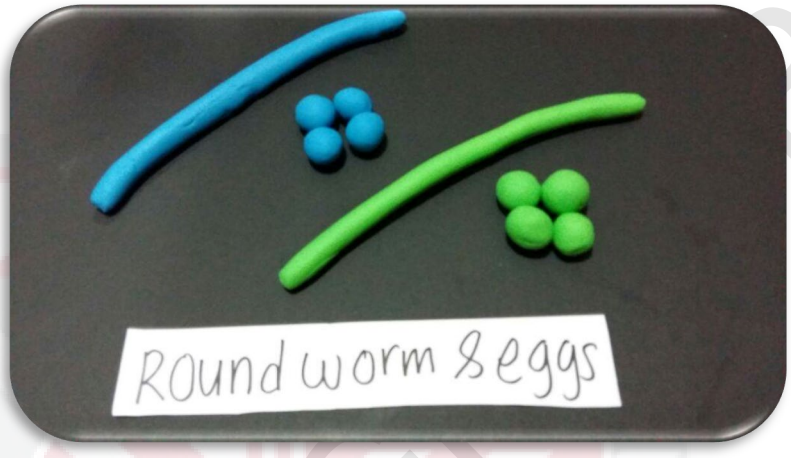
ball-with-straw combination that they put on the outside represent the various kinds of proteins found on the outside of the virus.

An example of a virus is influenza. Influenza is a common virus that is responsible for many different kinds of flu in humans as well as pigs, ducks and other animals. Picture below represents the virus model:



Lastly, in parasite section, the students need to used their clay by dividing the clay into half. Half of their clay would be used to make a long worm, and the other half was to be used to make several small round balls. The long worm that they had created represents a mature roundworm while several small round balls represent eggs from which a worm will hatch. Most parasites hatch from eggs.

Each group was given three minutes to create what they believed parasites look like when the facilitators give the signal by read aloud the instruction. Picture below represent the model of roundworm and eggs:



As a conclusion for activity in this module, the facilitators would ask questions to the students on what they had learnt from this activity such as what the three main types of pathogens that they had made, what differences between these three types in how they make more of themselves, what common diseases can these pathogens cause based on explaination given during the activities and what some precautions that can be taken to reduce infection from these pathogens. Thus, the students can recall and revise back what they had learnt. Example of model on the different types pathogens made by students as in appendix 5.

3.2.4 Module 4: Introduction to zoonotic diseases

The objectives of Module 4 were to introduce the term of zoonotic diseases and the different types of diseases that animals and humans can share. In this module, students were introduced to the term zoonotic disease and different

types of diseases that animals and human can share. Talks were guided by a slide presentation and interactive talk between the speaker and students.

3.2.5 Module 5: Dairy farm visit

Module 5 takes place on the second phase of the program. Students assembled at the dairy farm in the early morning at Ladang 16, UPM. In this visit, students listened to a short talk by the attending veterinarian officer at the farm on food safety in particularly drinking fresh milk. The term pasteurisation and personal hygiene after touching the animals were also emphasized in this module.

3.2.6 Module 6: Flashback activity – Wordsearch

In this module, students needs to recall the words that they have learned and heard from previous activities in phase one. The activity was a wordsearch that includes all terms related to zoonoses. A short flasback discussion with the students was also conducted by a speaker. Basically, the activity was wordsearch. An example of wordsearch as in appendix 6.

3.2.7 Module 7: Be a zoonotic disease detective

The objectives of Module 7 were to introduce to the diferent types zoonotic parasites, their mode of transsmission, life cycles and diagnosis technique in parasite detection. There were 4 activities in Module 4. First activity was the introduction of parasites and zoonotic parasites and what samples to collect for diagnosis of parasites by slide prsentation. Second activity was demostaration of fecal and blood examination such as demonstration of the fecal floatation technique for intestinal parasites and the wet mount technique for blood

parasite *(trypanosome).* The third activity was examination and drawing of the parasites that they had observed. In this activity, the students were divided into eight groups and each group was allocated one set of parasites (six specimens) and one tutor (postgraduate students). The student had been asked to draw and label the morphology of parasites and they were given for ten minutes for one specimen. The tutors had explained life cycle and mode of transmission of each parasite specimens while the students drawing the parasites. Last session was discussion with students on what they had learned. A short demonstration on proper hand washing technique was also introduced.

3.2.8 Module 8: My pet and I

Module 8 was a talk on having pets and precaution steps to be taken when handling animals. Talks were given by a small animal practice veterinarian with a guide of a slide presentation and residence cats from the University Veterinary Hospital, UPM.

3.3 Sampling and data collection

A total of 40 standard 6 students from Sekolah Kebangsaan Seri Selangor was assessed in this study. They consist of 22 female and 18 male from a multiracial backgrounds. The school zoonotic diseases awareness program was divided into two phases, first phase was conducted on the 5th October 2016 at the school followed by the second phase on the 10th October 2016 in UPM. The program conducted consists of eight modules and each module comprises of a few activities related zoonotic diseases education for school students. Basically the activities conducted at the school were based on Module 1,

Module 2, Module 3 and Module 4 while in UPM, activities conducted based on Module 5, Module 6, Module 7 and Module 8. A set of questionnaire on zoonotic diseases was designed to assess the awareness and knowledge of students on zoonotic diseases. The questionnaires (pre-survey forms) were distributed among the students to be answered before the students were introduced to the zoonotic diseases topics in the awareness program and the questionnaires (post-survey forms) which consist of the same questions as in pre-survey forms were distributed again after the awareness program finished. The same respondents were used for pre and post program.

3.4 Data analysis

Microsoft Excel® was used to edit the collected data and to construct graphic data. Data was analyzed using the IBM Statistical Package of Social Science (SPSS) version 22. Mann Whitney U Test was used to compare pre and post-program on awareness of zoonotic diseases among the students for each question.

4.0 RESULTS

4.1 Demographic of the respondents

A total of 40 respondents were obtained in this study. The demographic profile of the respondents were presented in Table 1.

Table 1: Demographic profile of the respondents in this survey in frequency and percentage.

Category		Frequency (n=40)	Percentage (%)
Gender	Male	18	45
	Female	22	55
Race	Malay	30	75
	Chinese	3	7.5
	Indians	4	10
	Others	3	7.5
Education level	Standard 6	40	100
Age	12 years old	40	100
Address	In the city	37	92.5
	Outside the city	3	7.5

A total of 40 respondents participated in this survey. They were standard 6 students of Sekolah Kebangsaan Seri Selangor consist of 55% of female and 45% of male from a multiracial backgrounds. 92.5% of students live in the city while 7.5% of students live outside the city. The same students were used for pre and post program in this survey. This group of students were chosen to be participated in this survey because they have good comprehension of English language, mature enough to be involved in this survey and this school also was one of the sekolah angkat of UPM.

4.2 Mean rank and P-value of each question by Mann Whitney U Test

Table 2: Mean rank and P-value for each question that had significant different in awareness score between before and after the awareness program.

Questions	Survey	Mean rank	P-value
Q1	Pre-program	30.26	< 0.001
	Post-program	50.74	
Q2	Pre-program	29.33	< 0.001
	Post-program	50.40	
Q3	Pre-program	28.17	<0.001
	Post-program	51.54	
Q4	Pre-program	27.70	< 0.001
	Post-program	50.71	
Q5	Pre-program	29.95	< 0.001
	Post-program	53.05	
Q6	Pre-program	22.23	<0.001
	Post-program	57.33	
Q7	Pre-program	25.07	< 0.001
	Post-program	48.68	
Q8	Pre-program	24.32	< 0.001
	Post-program	46.81	
Q9	Pre-program	23.06	< 0.001
	Post-program	47.24	
Q10	Pre-program	27.45	< 0.001
	Post-program	34.67	
Q12	Pre-program	26.92	< 0.001
	Post-program	52.75	
Q13	Pre-program	27.95	<0.001
	Post-program	53.05	
Q14	Pre-program	26.76	< 0.001
	Post-program	51.60	
Q15	Pre-program	22.68	< 0.001
	Post-program	58.33	
Q17	Pre-program	29.68	< 0.001
	Post-program	50.59	
Q19	Pre-program	25.75	< 0.001
	Post-program	49.98	
Q20	Pre-program	29.59	< 0.001
	Post-program	50.10	
Q21	Pre-program	22.60	< 0.001
	Post-program	57.29	
Q24	Pre-program	21.7	< 0.001
	Post-program	57.3	
Q25	Pre-program	25.33	< 0.001

	Post-program	48.42	
Q26	Pre-program	23.64	<0.001
	Post-program	50.63	
Q27	Pre-program	27.11	< 0.001
	Post-program	35.29	
Q28	Pre-program	21.73	< 0.001
	Post-program	57.81	
Q29	Pre-program	25.3	< 0.001
	Post-program	50.38	
Q30	Pre-program	25.33	< 0.001
	Post-program	48.42	
Q31	Pre-program	26.59	< 0.001
	Post-program	53.08	
Q32	Pre-program	23.64	< 0.001
	Post-program	50.63	
Q33	Pre-program	27.11	<0.001
	Post-program	35.29	
Q35	Pre-program	27.08	< 0.001
	Post-program	52.06	
Q36	Pre-program	21.73	<0.001
	Post-program	57.81	

In table 2 showed that among total of 35 questions, there were 31 questions in total that had significant different ($P < 0.05$) in awareness score between before and after the program was conducted. There were increase in mean rank in post-program for each question. The higher mean rank in post program indicate that there were increase in level of awareness among the students for this 31 questions after the awareness program was conducted.

Table 3: Mean rank and P-value for each question that had no significant different in awareness score between before and after the awareness program.

Questions	Survey	Mean rank	P-value
Q16	Pre-program	40.5	1
	Post-program	40.5	
Q22	Pre-program	40.8	0.864
	Post-program	43.7	
Q23	Pre-program	37.69	0. 769
	Post-program	36.32	
Q34	Pre-program	40.5	1
	Post-program	40.5	

In table 3 showed that among total of 35 questions, there were 4 questions in total that had no significant different ($P > 0.05$) in awareness score between before and after the program was conducted. In the table 3, it showed that the mean rank for question 16 and 34 were same betweeen pre and post-program while for question 22 and 23, the mean rank were decrease in the post-program, this mean that there were no increase in the level of awareness among the students for this 4 questions after the awareness program was conducted.

4.3 The type of questions

Table 4: List of questions that had significant different in awareness score between before and after the awareness program**.**

Sections		Questions
Section A: Health and diseases	Q1	I know what bacteria, viruses, and parasite are
	Q2	Animals can share bacteria, viruses and paasite with me
	Q3	Animal diseases can spread to human
	Q4	I know what zoonosis means
	Q5	I have been infected with zoonotic diseases before
	Q6	When I am at an area with animals arounds, I feel I am more at risk to contract a disease
	Q7	I avoid a big of people because I fear disease
	Q8	I have been ill before with the symptoms such as a sore throat , flu or
	Q9	I have been ill before with the symptoms feverdiarrhoea and vomiting
	Q10	When I am sick I often consume antibiotic
Section B: Pets	Q12	I have pet at home..
	Q13	I need to wash my hands after playing with my pets
Section C: Petting farms, zoos, & stray animals	Q14	I have recent contact with wildlife
	Q15	I wash my hands after visit to farms/zoos
	Q17	Stray animals and wildlife should be caught and trans-located away from housing area
	Q18	Stray animals and wildlife are pest like rat and mosquitos
Section D: Feelings, interactions & perceptions	Q19	I consider myself an animal lover
	Q20	I think feeding animlas are fun
	Q21	I like watching people feed animals but I dare not do it myself
	Q24	I am afraid that animals will pass on a disease to me
	Q25	Babies and children should not be allowed to get close to the animals
Section E: Food safety and personal hygiene	Q26	I have heard the term of ‘pasteurisation’
	Q27	I can drink freshly milked cow’s or goat’s milk

	Q28	I know the proper way to wash my hands to get rid of bad bacteria, viruses and parasite
	Q29	I prefer to use hand sanitisers than washing my hand
	Q30	Before eating, I routinely wash my hans after handling pets/animals
	Q31	If I keep my hands clean, I reduce the chances of getting sick
Section F: General	Q32	I am happy to learn new knowledge to prevent myself from getting sick
	Q33	I understand why it is important to take care of my personal hygiene
	Q35	I know what a veterinarian is
	Q36	I know what a medical doctor is

Table 4 above showed the type of questions that had significant different in awareness score between before and after the awareness program.

Table 5: List of questions that had no significant different in awareness score between before and after the awareness program.

Sections		Questions
Section C: Petting farms, zoos, & stray animals	Q16	It safe to play with a stray animal
Section D: Feelings, interactions & perceptions	Q22	I want to see animals but do not want them to come close to me
	Q23	I am afraid animals might bite or scratch me
Section F: General	Q34	I understand why it is important for a pet owner to be resposible for their animal' health

The table 5 above showed the type of questions that had no significant different in awareness score between before and after the awareness program.

4.4 Graphic data on the example of questions that had significant different in awareness score between before and after the awareness program.

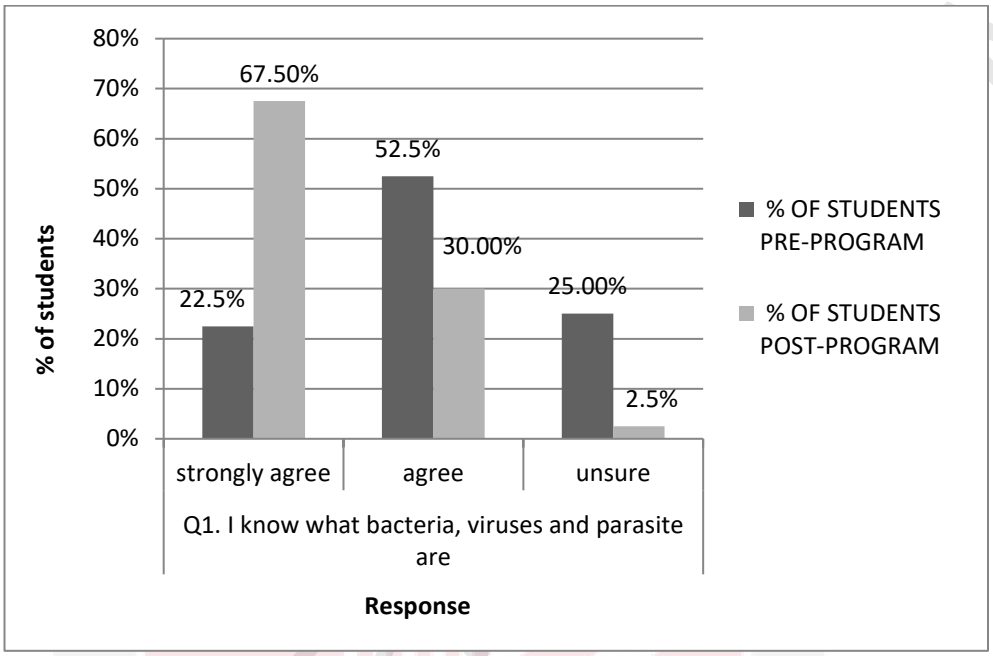


Figure 1: The percentage of students who answered "strongly agree", "agree" and "unsure" based on question 1: "I know what bacteria, viruses and parasite are".

Based on Figure 1, the percentage of students who answered strongly agree that "I know what bacteria, viruses and parasite are" was increase by 45% in post-program, answered agree was decreased by 22.5% and answered unsure was decreased by 22.5% in post-program.

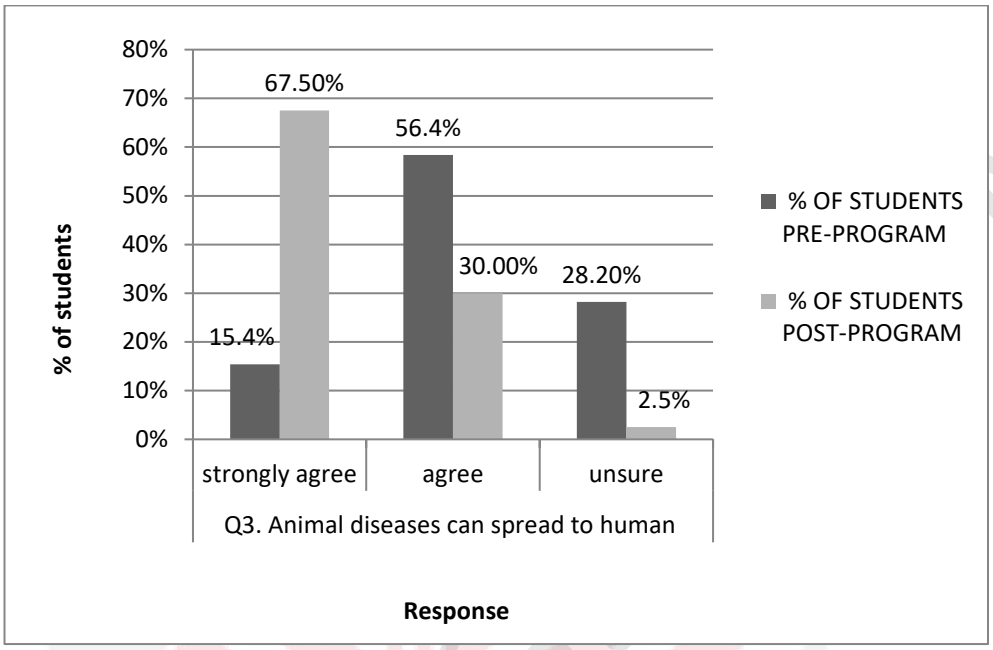


Figure 2: The percentage of students who answered "strongly agree", "agree" and "unsure" based on question 3: "animals diseases can spread to human".

The percentage of students who answered strongly agree that "animals diseases can spread to human" was increase by 52.1% in post-program, answered agree was decreased by 26.4% and answered unsure was decreased by 25.7% in post-program.

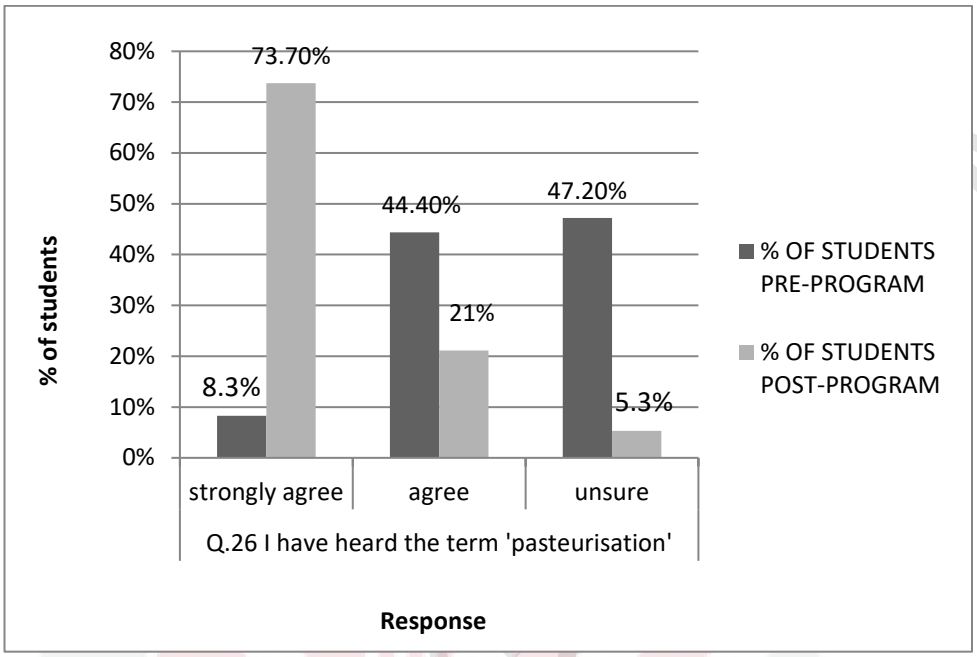


Figure 3: The percentage of students who answered "strongly agree", "agree" and "unsure" based on question 26: "I have heard the term of pasteurisation".

The percentage of students who answered strongly agree that "I have heard the term of pasteurisation" was increase by 65.4% in post-program, answered agree was decreased by 23.4% and answered unsure was decreased by 41.9% in post-program.

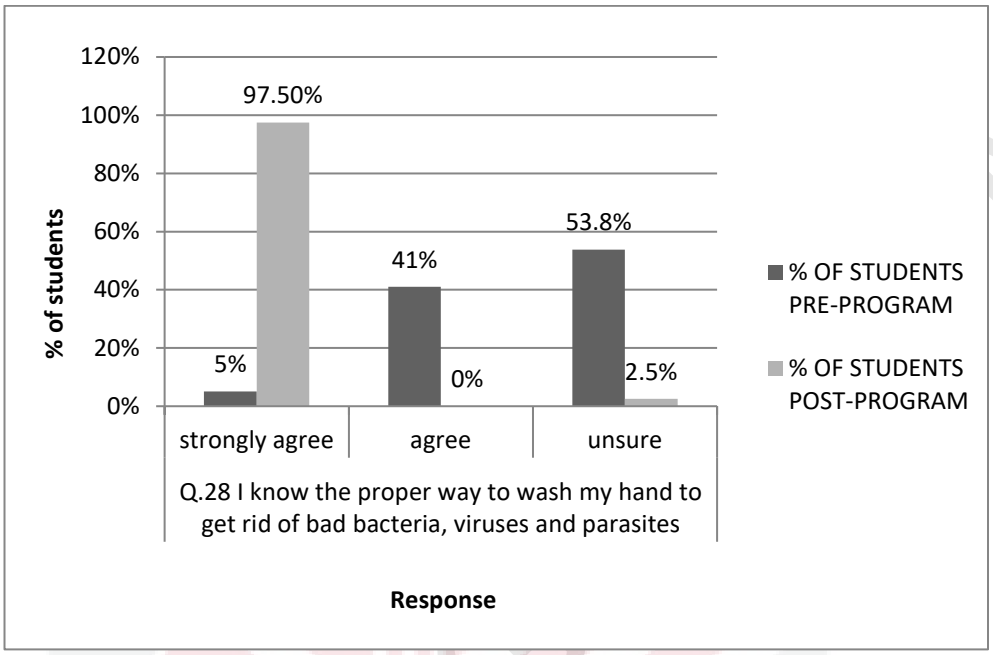


Figure 4: The percentage of students who answered "strongly agree", "agree" and "unsure" based on question 28: "I know proper way to wash my hands to get rid of bad bacteria, viruses and parasites".

The percentage of students who answered strongly agree that "I know proper way to wash my hands to get rid of bad bacteria, viruses and parasites" was increase by 92.5% in post-program, answered agree was decreased by 41% and answered unsure was decreased by 51.3% in post-program.

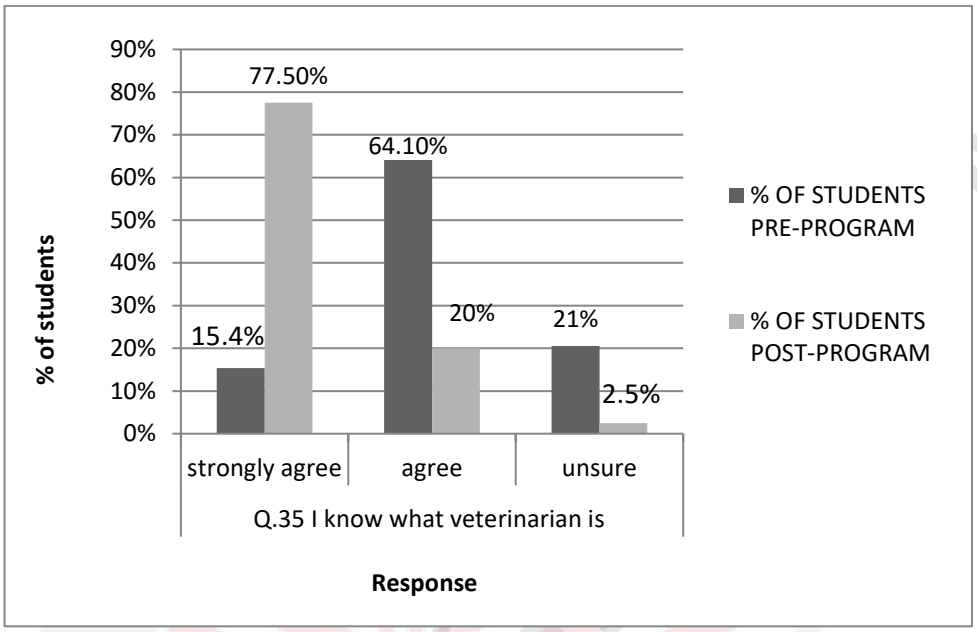


Figure 5: The percentage of students who answered "strongly agree", "agree" and "unsure" based on question 35: "I know what veterinarian is".

The percentage of students who answered strongly agree that "I know what veterinarian is" was increase by 62.1% in post-program, answered agree was decreased by 44.1% and answered unsure was decreased by 18.5% in post-program.

4.5 Graphic data on the example of questions that had no significant different in awareness score between before and after the awareness program.

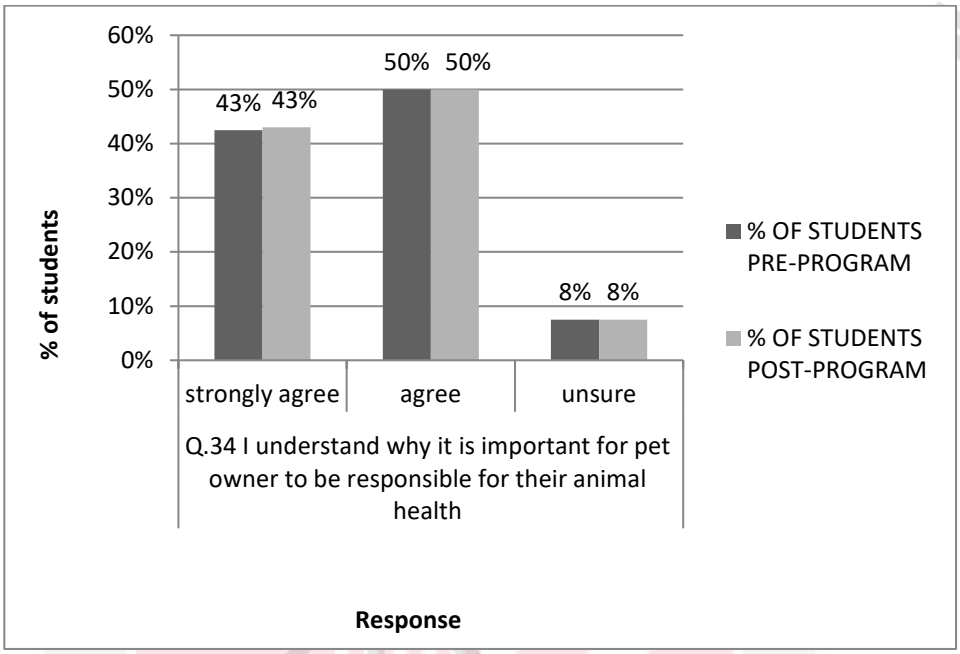


Figure 6: The percentage of students who answered "strongly agree", "agree" and "unsure" based on question 34: "I understand why it is important for pet owner to be responsible for their animal health".

The percentage of students who answered strongly agree that "I understand why it is important for pet owner to be responsible for their animal health" was same for pre and post-program, answered agree and unsure also same in post-program.

5.0 DISCUSSION

A total of 40 respondents was uesd in this survey. They were standard 6 students of Sekolah Kebangsaan Seri Selangor consist of 55% of female and 45% of male from a multiracial backgrounds. 92.5% of students live in the city while 7.5% of students live outside the city. The same students were used for pre and post program in this survey. This target population was chosen because this students had good comprehension of English language and standard 6 students were matured enough to be involved in this survey. This school also was one of the "sekolah angkat" of UPM.

Data was analyzed using Mann Whitney U Test to compare the pre and post-program on awareness on zoonotic diseases among the students by each question. Among total of 35 questions, there were 31 questions in total that had significant different ($P < 0.05$) in awareness score between before and after the program was conducted while 4 questions in total that had no significant different ($P > 0.05$) on awareness score between before and after the program was conducted. In the table 2 showed each question from 31 significant questions in total that the mean rank for each question were increase in the post-program. The higher mean rank in the post-program indicate that there were increased in the level of awareness on zoonotic diseases among the students after the program for this questions. In the table 3 showed that mean rank for question 16 and 34 were same for pre and post-program while the mean rank for question 22 and 23 were decreased in the post-program indicate that there was no increase in the level of awareness on zoonotic diseases among the students after the program for this questions.

Table 4 and 5 showed the types of questions that had singnificant different in awareness score and the types of of questions that had no significant different in awareness score between before and after the awareness program respectively. (89.1 %) from 35 total of questions had significant ($P < 0.05$) in awareness score between before and after the program was conducted while (11.4%) from 35 total of questions had no significant different ($P > 0.05$) on awareness score between before and after the program was conducted. The percentage of total of questions that had significant different ($P < 0.05$) in awareness score more than the percentage of total of questions that had no significant different ($P > 0.05$) on awareness score between before and after the program was conducted. Thus, there was significant different in the level of awareness among the students between before and after the program was conducted. We can also conclude that the school zonotic diseases awareness program was effective.

In the graphic data on the example of questions that had significant different in awareness score between before and after the awareness program:

Based on Figure 1, the percentage of students who answered strongly agree that "I know what bacteria, viruses and parasite are" was increase by 45% in post-program mean that there were increased in the number of students who know what bacteria, viruses and parasite are, answered agree was decreased by 22.5% could be due to increase in the percentage of students who answered strongly agree in the post-program and answered unsure was decreased by 22.5% in post-program mean that the students know what bacteria, viruses and parasite are after the program. We can

conclude that they had the knowlege on what bacteria, viruses and parasite are from the program.

Based on Figure 2, the percentage of students who answered strongly agree that "animals diseases can spread to human" was increase by 52.1% in post-program mean there was increased in the number of students who know animals diseases can spread to human after the program , answered agree was decreased by 26.4% could be due to increase in the percentage of students who answered strongly agree in the post-program and answered unsure was decreased by 25.7% in post-program mean that the students know animals diseases can spread to human after the program.

Based on Figure 3, the percentage of students who answered strongly agree that "I have heard the term of pasteurisation" was increase by 65.4% in post-program mean that the number of students who know the term of pasteurisation was increased after the program, answered agree was decreased by 23.4% could be due to increase in the percentage of students who answered strongly agree in the post-program and answered unsure was decreased by 41.9% in post-program mean that the students sure that they have heard the term of pasteurisation after the program since the students had been talked on term pasteurisation during the dairy farm visit.

Based on Figure 4, the percentage of students who answered strongly agree that "I know proper way to wash my hands to get rid of bad bacteria, viruses and parasites" was increase by 92.5% in post-program mean that there was increased in the number of students who know proper way to wash their hands to get rid of bad bacteria, viruses and parasites after the program , answered agree was decreased by 41% could be due to increase in the percentage of students who answered strongly agree in the

post-program and answered unsure was decreased by 51.3% in post-program mean the students sure how the proper way to wash their hands to get rid of bad bacteria, viruses and parasites after the program because the students had been demostrated on proper hand washing.

Based on Figure 5, the percentage of students who answered strongly agree that “I know what veterinarian is” was increase by 62.1% in post-program mean that there was increased in the number of students who know what veterinarian is after the program , answered agree was decreased by 44.1% could be due to increase in the percentage of students who answered strongly agree in the post-program and answered unsure was decreased by 18.5% in post-program mean students sure that they know what veterinarian is after the program was conducted since the students had been talked on term veterinarian in module 1.

In the graphic data on the example of questions that had no significant different in awareness score between before and after the awareness program:

Based on Figure 6, the percentage of students who answered strongly agree, agree, and unsure that “I understand why it is important for pet owner to be responsible for their animal health” was same for pre and post-program mean that there was no increased in the number of students who understand why it is important for pet owner to be responsible for their animal health after the program.

6.0 CONCLUSION

This study revealed that the students had acquired basic knowledge on zoonoses and ways to prevent transmission after participating in the school zoonotic diseases awareness program with the overall total of 89.1% of questions that had significant different ($P < 0.05$) in awareness score between before and after the program was conducted. Thus, there was significant different in the level of awareness among the students between before and after the awareness program was conducted and we can also conclude that the program was effective.

7.0 RECOMMENDATIONS

1. Need larger sample size for future study to get reliable data and more accurate result and findings.
2. To repeat the school zoonotic diseases awareness program in another different school with similar cohort to compare the level of awareness among the primary school students in different school as well as to assess the effectiveness of the program in the different students and school.

8.0 REFERENCES

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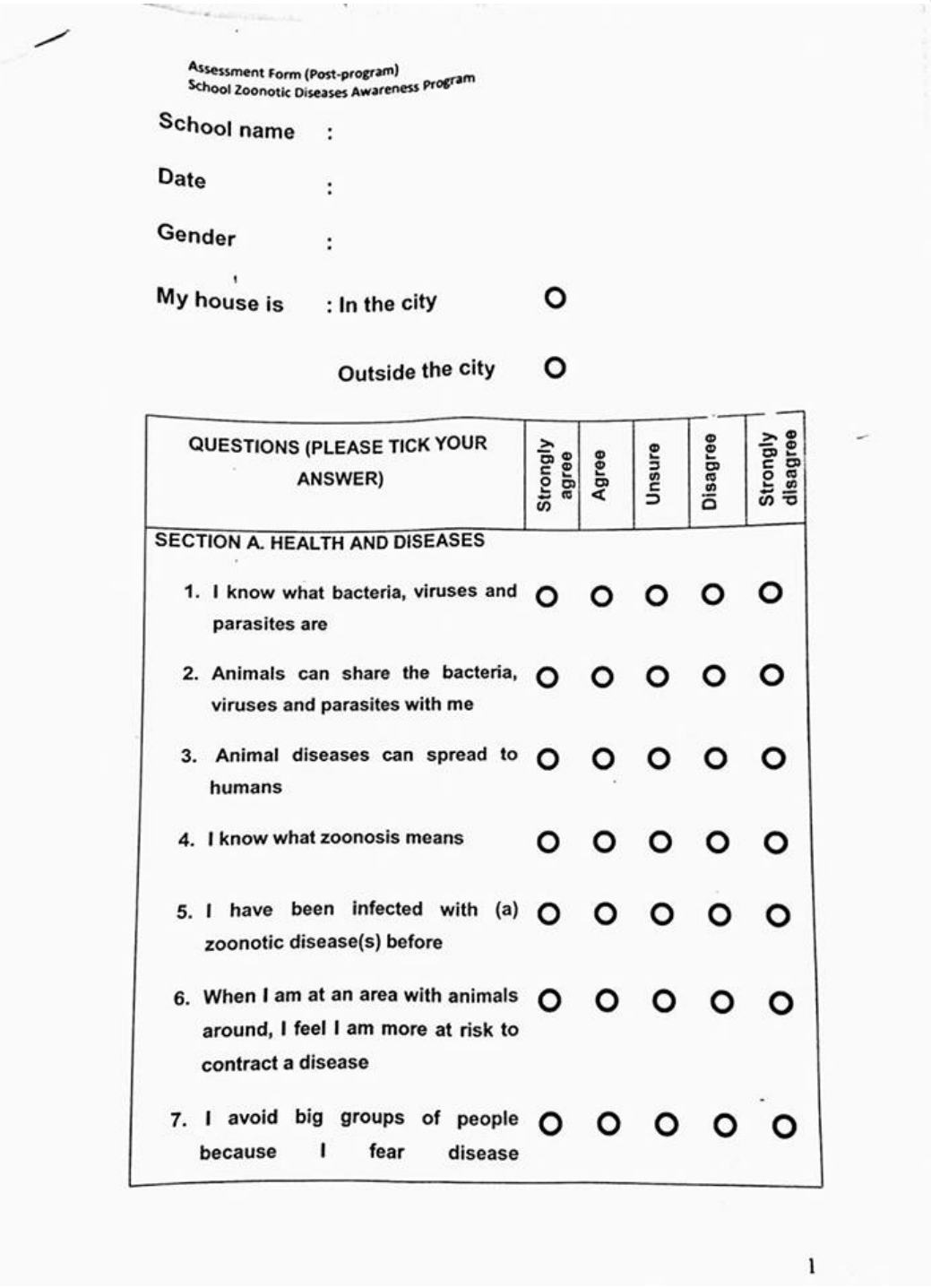
9.0 APPENDICES:

APPENDIX 1



Assessment Form (Post-program)
School Zoonotic Diseases Awareness Program

School name :

Date :

Gender :

My house is : In the city O

Outside the city O

QUESTIONS (PLEASE TICK YOUR ANSWER)	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
SECTION A. HEALTH AND DISEASES					
1. I know what bacteria, viruses and parasites are	O	O	O	O	O
2. Animals can share the bacteria, viruses and parasites with me	O	O	O	O	O
3. Animal diseases can spread to humans	O	O	O	O	O
4. I know what zoonosis means	O	O	O	O	O
5. I have been infected with (a) zoonotic disease(s) before	O	O	O	O	O
6. When I am at an area with animals around, I feel I am more at risk to contract a disease	O	O	O	O	O
7. I avoid big groups of people because I fear disease	O	O	O	O	O

1

Example of questionnaire form

APPENDIX 2

First phase - at Sekolah Kebangsaan Seri Selangor

APPENDIX 3

Second phase - at UPM

APPENDIX 4

SCHOOL ZOONOTIC DISEASES AWARENESS PROGRAM

PROGRAM TENTATIVE

5th October 2016 (Wednesday)
Itinerary Phase 1 (to be conducted in designated school)

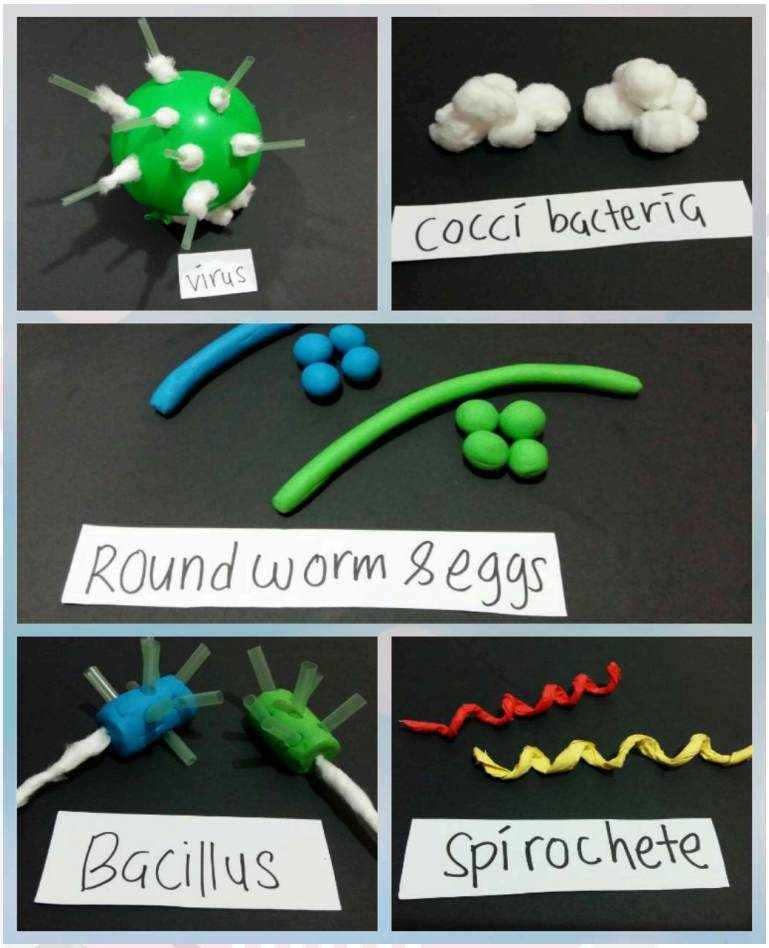
Time	Activities
0900 - 0930	Registration and breakfast/morning tea at school
0930 - 1000	Module 1: Introduction to UPM-Vet and What is a Vet Doctor?
1000 - 1015	Module 2: Ice breaking session
1015 - 1030	Pre-survey forms
1030 - 1200	Module 3: What is a pathogen?
1200 - 1230	Module 4: Diseases that animals and humans share (Introduction to Zoonotic disease)
1230 - 1300	Lunch and end of phase 1

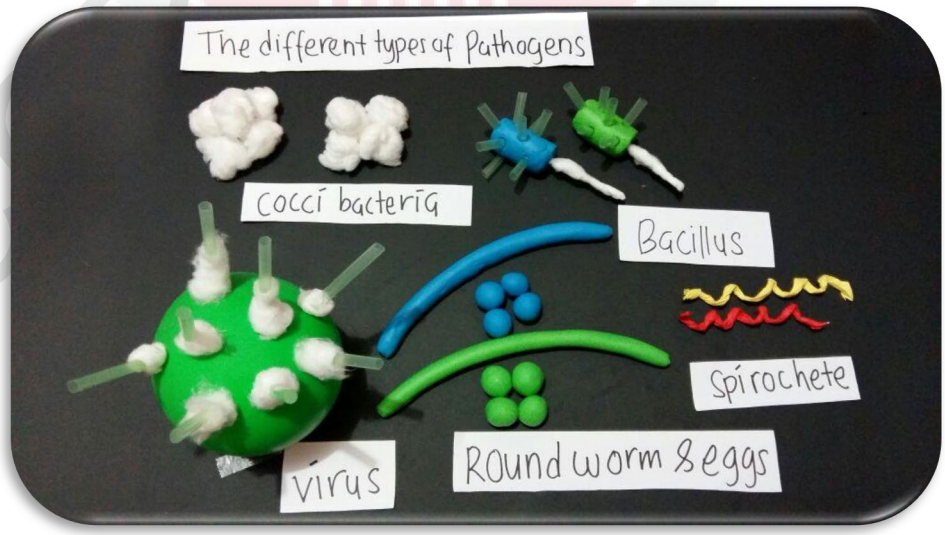
10th October 2016 (Monday)
Itinerary Phase 2 (to be conducted in UPM)

Time	Activities
0745 - 0800	Arrives in UPM Edu Park (Ladang 16) Registration
0800 - 0830	Breakfast (picnic) at Ladang 16
0830 - 0915	Module 5: Dairy Farm
0915 - 0930	Transport to Faculty of Veterinary Medicine UPM
0930 - 0945	Module 6: Flashback?
0945 - 1145	Module 7: Be a zoonotic disease detective
1145 - 1215	Module 8: My pets and i
1215 - 1230	Post-survey
1230 - 1300	Lunch, depart from UPM and end of phase 2

Tentative of the program

APPENDIX 5





Model of the different types of pathogens

APPENDIX 6

SCHOOL ZOONOTIC DISEASES AWARENESS PROGRAM
PHASE 2

MODULE 6 FLASHBACK

FIND WORDS

Y	H	U	T	H	S	R	A	I	O	H	T	Y	U	X
A	Z	H	B	U	Y	R	A	N	I	R	E	T	E	V
C	S	Y	I	B	H	X	V	I	I	R	Y	T	E	R
C	A	P	C	X	Y	R	T	C	T	F	U	W	T	J
D	N	Z	C	S	G	F	S	S	O	E	E	T	E	M
B	I	O	O	G	I	G	T	E	B	R	R	T	H	H
A	T	S	C	O	E	H	I	S	V	Z	O	O	C	O
C	I	R	M	D	N	S	T	A	C	B	S	N	O	S
A	Z	F	Y	R	E	O	D	E	Q	U	T	U	R	P
E	E	N	C	Y	R	F	T	S	R	P	S	V	I	I
A	R	I	O	X	Y	E	T	I	S	A	R	A	P	T
I	L	O	C	E	Z	T	V	D	C	V	A	T	S	A
R	A	I	L	E	W	M	S	U	T	G	I	R	L	L
E	T	L	S	A	L	M	O	N	E	L	L	A	E	M
T	A	I	T	B	E	L	L	B	A	B	C	T	T	A
C	R	E	A	S	R	A	S	O	I	L	G	S	R	S
A	R	B	T	A	N	M	R	O	W	D	N	U	O	R
B	I	N	S	C	O	N	T	A	M	I	N	A	T	E
A	B	L	D	E	W	U	T	Z	Y	X	K	G	D	F
V	C	H	J	L	M	O	Y	R	E	S	T	F	O	P

BACTERIA ECOLI VIRUS

ZOONOTIC DISEASES SPIROCHETE

SALMONELLA CELLS PARASITE

COCCI ROUNDWORM VETERINARY

WATER CONTAMINATE CATS

DOGS SANITIZER HOSPITAL

RATS SOIL ZOO

HYGIENE

Example of wordsearch activity