



UNIVERSITI PUTRA MALAYSIA

**SURVEY ON AWARENESS OF RABIES AS ZOO NOTIC DISEASE
AMONG DOG OWNERS IN UNIVERSITY VETERINARY HOSPITAL
(UVH), FACULTY OF VETERINARY MEDICINE, UNIVERSITI PUTRA
MALAYSIA**

AMIRAH ABU BAKAR

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FPV 2018 6**

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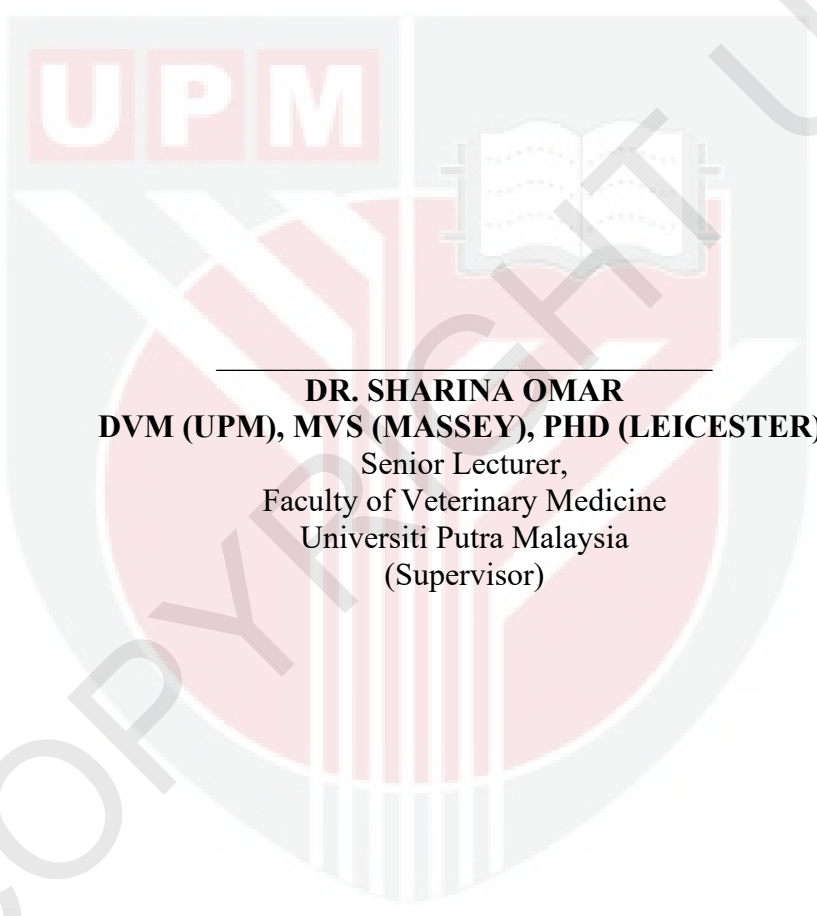
AMIRAH ABU BAKAR

A project paper submitted to the
Faculty of Veterinary Medicine, Universiti Putra Malaysia
In partial fulfillment of the requirement for the
DEGREE OF DOCTOR OF VETERINARY MEDICINE
Universiti Putra Malaysia
Serdang, Selangor Darul Ehsan.

MARCH 2018

CERTIFICATION

It is hereby certified that we have read this project paper entitled “Survey on awareness of Rabies as zoonotic disease among dog owners in University Veterinary Hospital (UVH), Faculty of Veterinary Medicine, Universiti Putra Malaysia”, by Amirah bt. Abu Bakar and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfillment of the requirement for the course VPD 4999 - Project.

The logo of Universiti Putra Malaysia (UPM) is a shield-shaped emblem. It features a red and white color scheme. At the top left, the letters 'UPM' are written in white on a red background. In the center, there is a stylized white bird or wing shape. To the right of the bird, there is an open book with text on its pages. Below the book, there are several vertical white lines of varying heights, resembling a barcode or a stylized representation of a building or a flag. The entire logo is set against a light gray background.

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DEDICATION

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

Special dedication and appreciation I give to...

My beloved family, who has always prayed for my success and showered me with their unchanged love

Abu Bakar Bin Mat Isa

Salamah Binti Abdullah

Muhammad Syahmi Abu Bakar

Nurnajwa Husna Abu Bakar

My beloved friends, who drive my journey like a roller coaster

Geng Kiah and Poshroom

Arustika Dancers and Arustika Putrasakti family

And to my cat at home, Omel and in memory, Adek

ACKNOWLEDGEMENTS

First and foremost, I would like to thank Allah SWT for ease my journey in finishing my final year project.

I wish to express my deep sense of regards and indebtedness to my supervisors, Dr. Sharina Omar and Dr. Puteri Azaziah Megat Abdul Rani for their guidance throughout the project.

Special thanks to Boehringer Ingelheim for providing tokens of appreciation for my respondents.

Special thanks to all my friends who helped me directly or indirectly throughout my final year project.

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ABSTRAK

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

SOAL SELIDIK MENGENAI KESEDARAN RABIES SEBAGAI PENYAKIT**ZOONOTIK DI KALANGAN PEMILIK ANJING DI HOSPITAL****VETERINAR UNIVERSITI (UVH), FAKULTI PERUBATAN VETERINAR,****UNIVERSITI PUTRA MALAYSIA****Oleh****Amirah Bt. Abu Bakar****2018****Penyelia: Dr. Sharina Omar****Penyelia bersama: Dr. Puteri Azaziah Megat Abdul Rani**

Rabies dianggap sebagai salah satu penyakit zoonotik paling penting kerana semua mamalia terdedah kepada rabies termasuk manusia. Adalah sangat penting bagi pemilik anjing untuk menyedari rabies bagi mengelakkan penularan penyakit semasa mengendalikan haiwan yang dijangkiti. Kajian ini dijalankan untuk menentukan tahap kesedaran rabies sebagai penyakit zoonotik di kalangan pemilik anjing di Hospital Veterinar Universiti (UVH). Satu set borang soal selidik terdiri daripada pelbagai pilihan dan soalan tertutup yang terdiri daripada tahap jawab balas yang berbeza mengenai rabies diedarkan selama 3 minggu kepada pemilik anjing yang berbeza di UVH. Seramai 33 penjawab telah memberi maklum balas. Data dianalisis menggunakan statistik deskriptif untuk menentukan tahap kesedaran rabies. Majoriti

pemilik anjing mempunyai tahap kesedaran yang rendah iaitu sebanyak 85% (n=28). Terdapat juga perkaitan yang nyata antara tahap kesedaran rabies dengan sumber maklumat yang diperolehi oleh pemilik anjing [Nilai $P = 0.036$ ($\alpha = 0.05$)]. Di samping itu, sembilan daripada dua belas pemilik anjing (75%) yang digigit atau dicakar oleh anjing tidak mendapatkan rawatan perubatan. Oleh itu, kita dapat menyimpulkan bahawa tahap kesedaran rabies sebagai penyakit zoonotik di kalangan pemilik anjing masih rendah walaupun mengetahui ia berbahaya kepada manusia.

Kata kunci: Rabies, penyakit zoonotik, kesedaran, soal selidik, pemilik anjing

ABSTRACT

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

**SURVEY ON AWARENESS OF RABIES AS ZONOTIC DISEASE AMONG
DOG OWNERS IN UNIVERSITY VETERINARY HOSPITAL (UVH),****FACULTY VETERINARY MEDICINE,****UNIVERSITI PUTRA MALAYSIA**

by

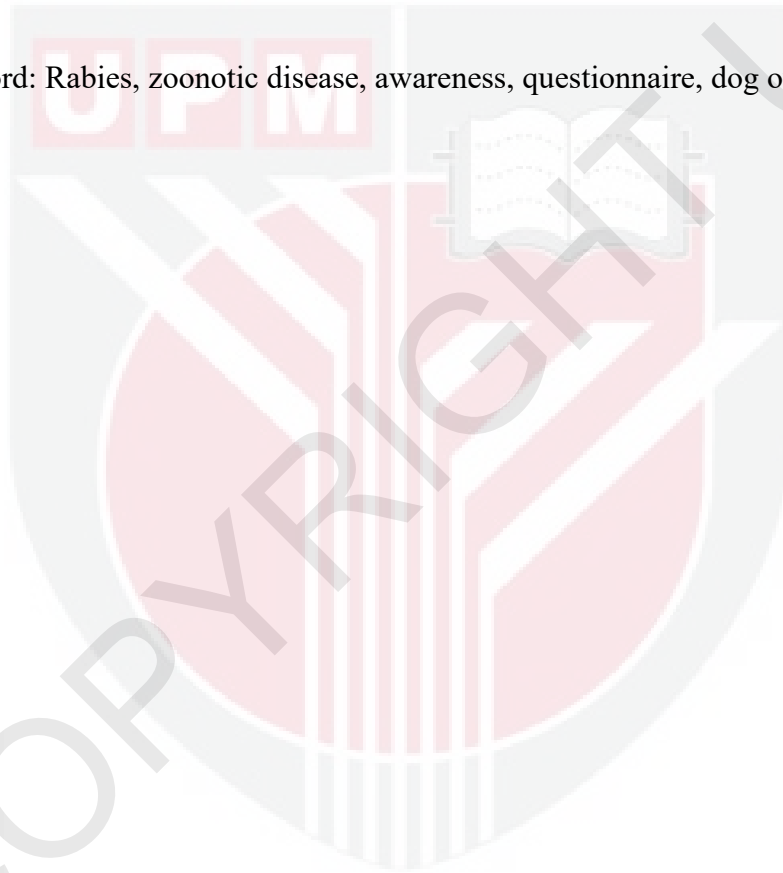
Amirah Bt. Abu Bakar**2018****Supervisor: Dr. Sharina Omar****Co-Supervisor: Dr. Puteri Azaziah Megat Abdul Rani**

Rabies is regarded as one of the most important zoonotic diseases as all mammals are susceptible to rabies including human. It is especially important for dog owners to be aware of rabies to prevent disease transmission when handling the infected animals.

This study was conducted to determine the level of awareness of rabies as zoonotic disease among dog owners in University Veterinary Hospital (UVH). Questionnaire consist of multiple choice and closed-ended questions comprising the different level of responsiveness on rabies was prepared and distributed to different dog owners at UVH for three weeks. A total of 33 respondents participated in this project. The data was analyzed using descriptive statistics to determine the level of awareness of Rabies. About 85% (n=28) of dog owners showed low level of awareness. The level

of awareness and the source of information on rabies were significantly associated [P value = 0.036 ($\alpha = 0.05$)]. In addition, nine out of twelve dog owners (75%) who experienced dog bite or dog scratch did not seek medical treatment. Thus, we can conclude that the level of awareness of rabies as zoonotic disease among dog owners was at low level despite knowing it is infectious to human.

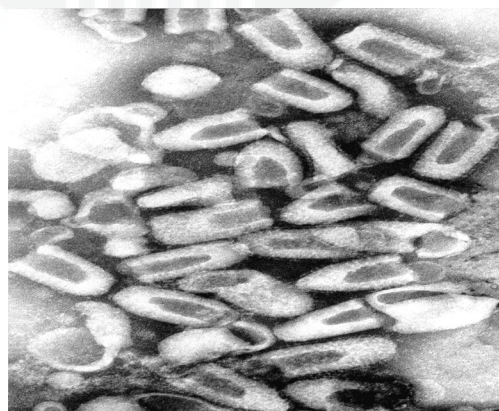
Keyword: Rabies, zoonotic disease, awareness, questionnaire, dog owner



1.0 INTRODUCTION

Rabies is a zoonotic disease caused by negative-strand ribonucleic acid (RNA) neurotropic viruses of the genus *Lyssavirus* from family *Rhabdoviridae* and order *Mononegvirales*. The name *Rhabdo* originated from Greek word meaning bullet or rod shape. As the name given, the virus resembles bullet shape as showed in **Figure 1**(Garg, 2014). According to Centre for Food Security & Public Health [CFSPH] in 2012, all mammals including humans and bats, could be infected by rabies virus subsequently become sick. Each rabies virus strain is maintained in a particular reservoir such as racoon strain in racoons, bat strain in bats and dog strain in a dogs (Garg, 2014). Human beings can be contracted with rabies through the bite, lick or scratch from rabid animal (CFSPH, 2012).

Figure 1: Rabies virus at magnification of 70000X, purified from an infected cell culture. Negatively strand virions showing characteristics of “bullet shape” (Adapted from Murphy, 2012).



The initial clinical signs are often nonspecific and may include apprehension, restlessness, anorexia or an increased appetite, vomiting, a slight fever, dilation of the pupils, hyper-reactivity to stimuli and excessive salivation. Animals often exhibit change in behaviour and temperament. The infected animals may either become unusually aggressive or uncharacteristically affectionate and eventually death (CFSPH, 2012).

The last case of rabies in Malaysia was dated in 1999 and Malaysia was conferred rabies-free status by the World Organization for Animal Health (OIE) in 2012. An outbreak of rabies occurred at the “rabies immune belt”, an area closed to the border of Thailand (Department of Veterinary Services [DVS], 2016) after three years of the endowment. The first case was reported in the state of Perlis in which eight people had been bitten where two out of 4 dogs captured and tested were positive for rabies. Following the case, there were several other reports on dog-bite cases spread to Kedah and Penang that prompted health authorities to start an aggressive response. Stray dogs were euthanized and vaccination for all pets at the affected area were enforced (Laura, 2015). Recently in July 2017, another incidence of rabies was reported in Sarawak. Five human rabies cases and almost 800 cases of people being bitten by rabid animals have been recorded in Serian, Sri Aman, and Kuching divisions. All the five-people died, and no new cases had been reported since then (Center for Disease Control & Prevention [CDC], 2017). However, on 4th February 2018, seventh victim who confirmed had rabies has died while sixth victim is still in critical condition and dependent of life

support machine at his home in Kampung Kuala, Serian, Sarawak (Adib, 2018).

Rabies has recently re-surfaced in Malaysia, therefore it is in need of creating awareness especially to the dog owners on the danger of the virus, how to respond swiftly to bitten and infection, and on the importance of reporting suspected cases.

Hence, this project was conducted to evaluate the level of awareness of rabies as zoonotic disease among dog owners via a set of questionnaire regarding Rabies. This project was conducted for 3 weeks at University Veterinary Hospital (UVH), Faculty of Veterinary Medicine, Universiti Putra Malaysia.

The objectives of the project were to study the level of awareness in dog owners about Rabies as zoonotic disease, to study level of awareness in dog owners on importance of dog vaccination and to educate dog owners on importance of seeking medical treatment.

2.0 LITERATURE REVIEW

2.1 Rabies in Asia

Asia holds the maximum burden of rabies. According to the WHO Expert Consultation on Rabies (2004), about 56% of total global human rabies death occur annually in Asia. Forty per cent of people who were bitten by suspected rabid animals are children under 15 years of age. Rabies is maintained in two epidemiological cycles, urban and sylvatic cycle. In urban cycle, dogs are the main reservoir host. This type of cycle predominates in India and other developing countries in Asia, Africa, Central and South America with large populations of stray and unvaccinated dogs. The main route of transmission is through the bite of rabid dogs (Garg, 2014). Approximately 99% of human death due to rabies was caused by dog's bites (Yousaf *et al.*, 2012). In another report by Garg (2014), 72.5% of dog bites were from stray dogs.

2.2 Predisposing and Risk Factors

Several factors could predispose a person to higher risk of acquiring the infection than others. Continuous and frequent possible exposure such as geographical region, occupational and activities in close or within the endemic areas for rabies. Animal handlers, zoo keepers, researchers, veterinarian and pet owners fall into this category. Laboratory workers were also at risk when handling the samples of rabies virus. Furthermore, the inadequate medical facilities for diagnosis of rabies and insufficient supply of rabies vaccine may increase the risk of exposure to rabies virus. Another theory by Garg (2014) suggested that deforestation could also be part of the

contributing factor. Wildlife would lose their normal habitat in forest which lead them to search for new and nearby places which usually were the housing areas. This would result in spill-over of the infection to naïve domestic or pet animals as well as to human.

2.3 Rabies Awareness in Asia

Malaysia is classified as one of the countries at high-risk of rabies infection (Health Protection Scotland, 2012; Health Protection agency, 2012). According to survey conducted by Dodet, B. *et al.*(2008), only 34% of the 4359 respondents replied did not know about rabies before being bitten and the main sources of information on rabies came from relatives and neighbours (36%) followed by medical doctors (24%). Insufficient surveillance system, lack of commitment to control programme and limited access to modern rabies vaccines and immunoglobulin such as health centers too far from home or due to expensive vaccine prices were some of the constraints in controlling rabies in Asia. However, lack of awareness among public is said to be the main reason why rabies is still endemic in Asia (Yousaf *et al.*, 2012; Tenzin & Ward, 2012).

3.0 MATERIALS AND METHODS

3.1 The Questionnaire

The questionnaire was designed based on the questionnaire set by Global Alliance for Rabies Control. The questionnaire was constructed taking into consideration certain factors that were thought to have some influence on the level of awareness of dog owners, such as education level and source of information of rabies. The questionnaire comprised of multiple choice questions and closed-ended questions on rabies and were divided into five sections: Section A focusing on the demographic of the respondents, Section B on the awareness of rabies, Section C on the knowledge about rabies, Section D on dog vaccination programme and Section E on the healthcare-seeking behaviour in dog owners. Respondents who were the dog owners, required to answer the questionnaire once only. Both self- and assisted-questionnaire type of completion have been applied throughout the survey. The English language version of the questionnaire is included in Appendix I to Appendix VI in this dissertation. The term respondents will be used in the thesis implying to the dog owners that participated in this project.

3.2 Distribution of questionnaire

The questionnaire was distributed within 3 weeks period to dog owners at the University Veterinary Hospitals (UVH), Faculty of Veterinary Medicine, Universiti Putra Malaysia. Only 33 respondents participated when

approached randomly throughout the survey period starting from 15th January 2018 to 2nd February 2018. Token of appreciation in the form of pen and pamphlet on rabies were given to respondents involved in this project.

3.4 Data analysis

The data was analysed using descriptive statistics to determine the level of awareness and knowledge on rabies; importance of dog vaccination; and healthcare-seeking behaviour among dog owners based on their scores. Respondents who answered up to Section B was fall into “low level” of awareness. Respondents who scored 1 to 4 correct answers in Section C was considered to have “moderate level” while respondents who scored 5 to 7 correct answers in Section C was considered of having “high level” of awareness on rabies. Chi-square was used to determine the association between the factors with the level of awareness and knowledge of rabies at 95% confidence level with significant level of p-value less than $\alpha = 0.05$.

4.0 RESULTS

4.1 Demographic of the respondents

A total of 33 respondents participated during the three weeks study at UVH among which 23 dog owners (70%) were female and 10 were male (30%). In general, majority (37%, n=12) of the respondents age between 20 and 29 years old, 18%(n=6) were age between 30 and 39 years old, 30%(n=10) were between 40 and 49 years old and 15%(n=5) were above 50 years old. In terms of level of education, 40%(n=13) of the respondents were undergraduate students, 24%(n=8) were postgraduate, 15%(n=5) were Sijil Pelajaran Malaysia (SPM) holders, 18%(n=6) were Sijil Tinggi Pelajaran Malaysia (STPM) or Diploma holders and one respondent had other type of education.

4.2 Level of awareness of rabies among dog owners in UVH

The results from the survey showed that 85%(n=28) of respondents have heard about rabies while 15%(n=5) have not heard about rabies before. The data is displayed as showed in **Table 1**.

Table 1 showed the frequency and percentage of response from respondents regarding question “Have you heard about rabies?”

Response	Frequency (n=33)	Percentage (%)
Yes	28	85%
No	5	15%

From the data analysis, all respondents agreed that rabies was dangerous to humans. However, 82%(n=27) respondents thought that rabies could be

treated, both in human and animal via modern treatment. Meanwhile 64%(n=21) respondents thought rabies could be cured by modern and 15%(n=5) respondents believed that homemade remedy could be used to tackle rabies infection while 21%(n=7) of respondents did not respond to the question. The analysis was showed in **Figure 2** and **Figure 3** below. Only small number 15%(n=5) of respondents agreed that rabies was not treatable.

Figure 2 showed the responses to the question “Is rabies treatable in both human and animal?”

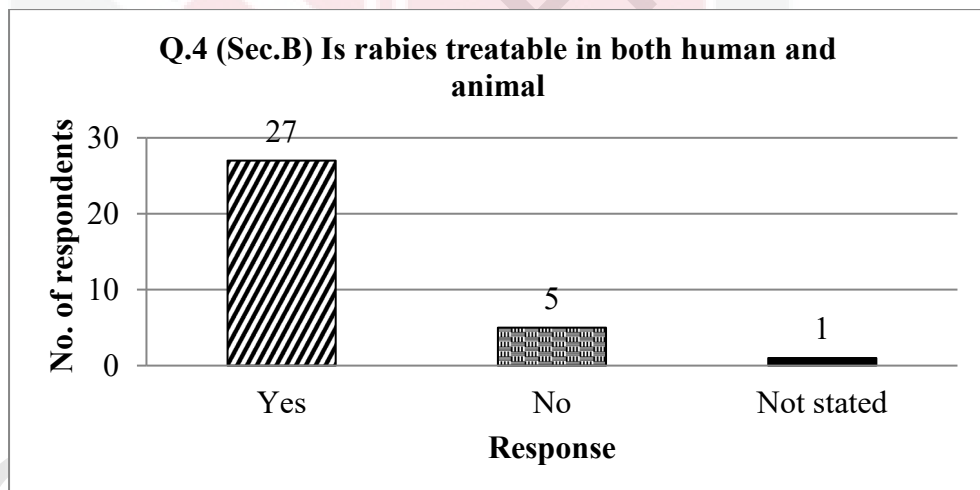
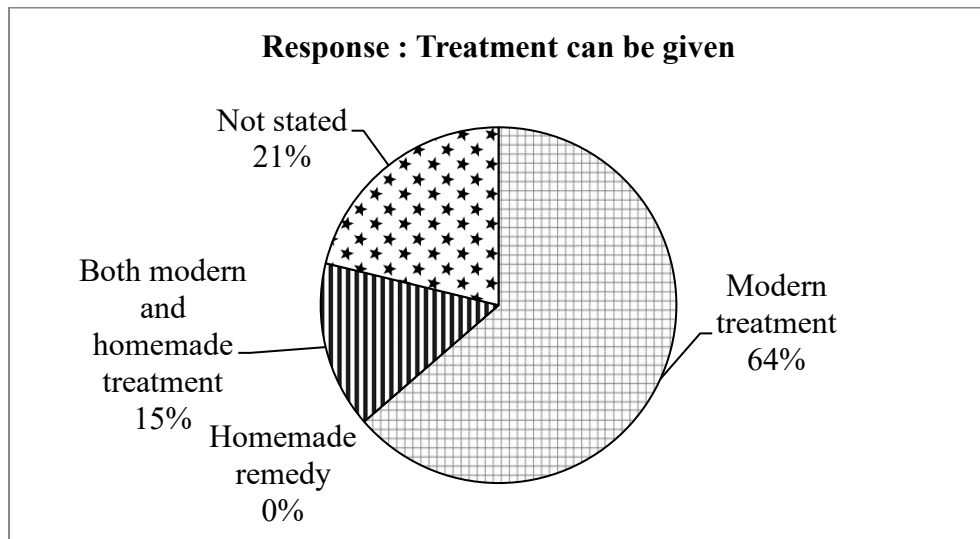


Figure 3 showed frequency of response from respondents regarding question “What treatment can be given?”



Based on the scores obtained, 85%(n=28) of respondents showed low grading score. The description of each grading and score result was shown in **Table 2**.

Table 2 showed the grading score for the level of awareness and knowledge of rabies among respondents at University Veterinary Hospital, Universiti Putra Malaysia.

Grading	Score	Overall score (%)
Low	(only up to Section B)	85%(n=28)
Moderate	(1 to 4 in Section C)	12%(n=4)
High	(5 to 7 in Section C)	3%(n=1)

4.3 Factors associated with level of awareness of rabies among dog owners in UVH

Two factors that were analysed for association with the level of awareness were the level of education and source of information. Chi-square test was used and no significant association were seen between level of education and

the level of awareness of rabies [P value = 0.405 ($\alpha = 0.05$)]. However, there was a significant association between source of information with level of awareness of rabies [P value = 0.036 ($\alpha = 0.05$)] as showed in **Table 3**. Based on cross tabulation analysis in **Table 4**, mass media had the highest proportion for both low and moderate level of awareness of rabies compared to other groups of information sources (colleague, education, social media, other and not stated).

Table 3 showed the association between the level of education and source of information with level of awareness of rabies

Dog owner-associated factors	Level of awareness of rabies*
Level of education	0.405
Source of information	0.036

*Chi-square test, significant P-value, $<\alpha=0.05$

Numbers in bold indicate $P<0.05$

Table 4 showed cross tabulation analysis between source of information with level of awareness of rabies obtained by respondents

Source of information	Level of awareness of Rabies			Total
	Low	Moderate	High	
Colleague	1	0	1	2
Education	3	0	0	3
Mass Media	9	3	0	12
Social Media	8	1	0	9
Other (parents)	1	0	0	1
Not stated	6	0	0	6
Total	28	4	1	33

4.4 Awareness of rabies control programme among dog owners

Based on the findings from the survey, 91%(n=30) of respondents had their dogs vaccinated and only 52%(n=17) out of 30 respondents had vaccinated their dog(s) against Rabies. Regarding the respondents knowledge on rabies monitoring plan, 76%(n=25) of them stated that regular vaccination for rabies could be done. About 6% (n=2) respectively thought that confining the dog and dog elimination were action can be taken to monitor rabies. The other 12% (n=4) did not have the knowledge on method of monitoring rabies. The results were showed in **Figure 4**.

Figure 4 showed responses to the question “Which action can be taken to monitor rabies?”

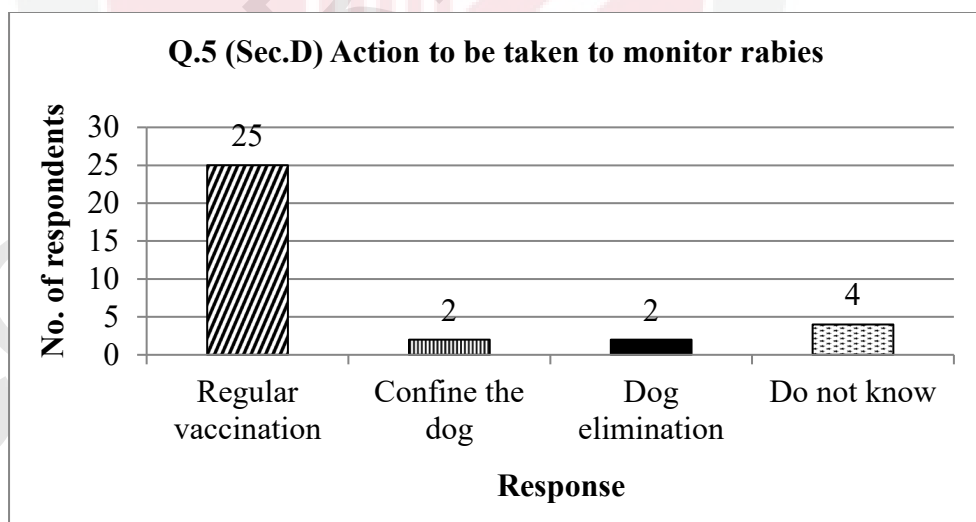
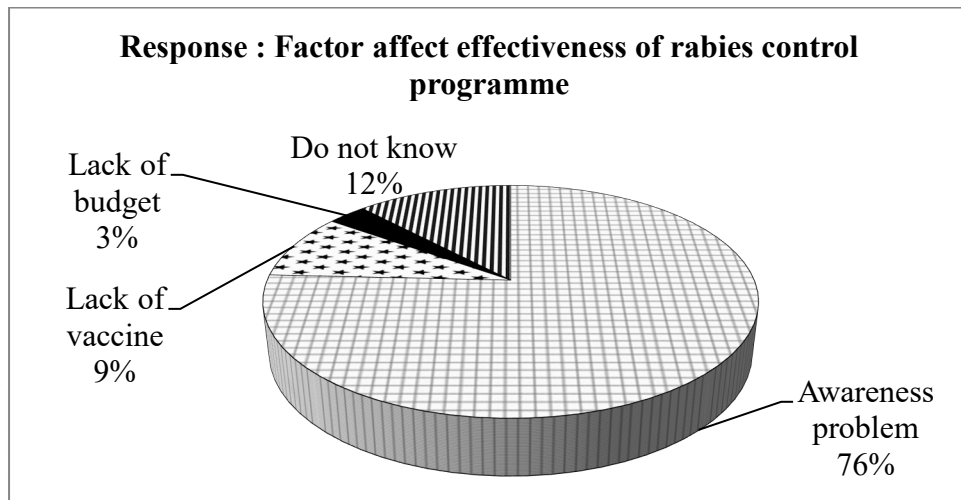
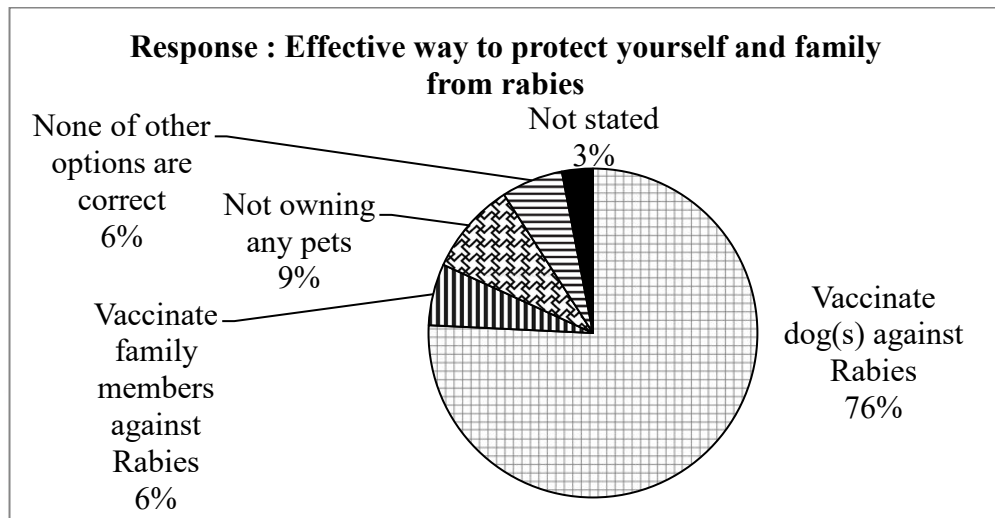


Figure 5 showed percentage of response from respondents regarding question “Factors that affect effectiveness of rabies control programme”



Based on the findings in **Figure 5**, most of respondents believe that awareness problem 76%(n=25) was the factor that could affect effectiveness of rabies control programme followed by lack of vaccine 9%(n=3) and lack of budget 3%(n=1). In addition, response regarding effective way to protect human from rabies are shown in **Figure 6**. Majority of respondents agreed that through vaccination, their family and his/herself could be protected from rabies 76%(n=25). On the other hand, small number of respondents choose not owning any pets 9%(n=3) and vaccinate family members against rabies (6%, n=2) were the ways to protect themselves from rabies infection.

Figure 6 showed percentage of response from respondents regarding question “The most effective way to protect yourself and your family from rabies”



4.5 Dog owners behaviour in seeking medical treatment

Out of the 33 respondents, only 12 dog owners have been scratched or bitten by dog. Based on the result, nine of them washed their wound thoroughly with water and soap as the immediate action after bitten or scratched. The rest of the respondents did not take any immediate action. Nevertheless, nine out of the twelve respondents did not seek immediate treatment at any medical facilities after bitten or scratched. **Table 5** showed options of immediate action to be taken after being bitten or scratched.

Table 5 showed frequency and percentage of response to the question “What action did you take immediately after being bitten or scratched?”

Response	Frequency (n=12)	Percentage (%)
Washed wound with water and soap	9	75%
Did not do anything	3	25%
Apply traditional medicine	0	0%
Bandage the wound	0	0%
Took painkiller	0	0%

5.0 DISCUSSION

According to the cumulative surveillance of rabies conducted by the Department of Veterinary Services (DVS) of Malaysia for the year 2015/2016, about 32,400 awareness programmes on rabies have been steered in Perlis, Kedah and Pulau Pinang. However, there has been no studies investigating the level of awareness of rabies as zoonotic disease among dog owners in Malaysia. Based on **Table 2**, the level of awareness of rabies among dog owners were still low even though majority of dog owners claimed they were aware about rabies. This contradiction happened was probably because 82% (n=27) of respondents thought that rabies is treatable despite knowing that most often rabies could cause death to human and animals. High number of respondents also obtained low grade of awareness as a result of lack of knowledge of rabies despite a prior information about rabies. This finding was consistent with the finding by Sambo *et al.* in 2014 who showed that poor awareness about the fatal nature of rabies are likely due to a lack of knowledge. Furthermore, effective education was mentioned to influence better knowledge about rabies. Early exposure on the detrimental effect of rabies should be introduced as early as primary school children to achieve the objective of awareness campaign (Dodet *et al.*, 2008).

The result in **Table 3** showed that the source of information had significant association with the level of awareness of rabies among dog owners in UVH. This was not surprising as most of our respondents obtained information about rabies from social media and mass media. This finding

suggested that the information from both resources were inadequate to create awareness and broaden the readers' knowledge about rabies. Apart from that it could also suggest that the frequency of coverage on rabies was insufficient to develop the understanding on the importance of the disease. This is especially evident based on the cross-tabulation analysis between source of information and the level of awareness as shown in **Table 4**. Nine and eight of respondents with low level of awareness obtained information about rabies from mass media and social media respectively. Surprisingly, one dog owners that obtained high score attained the information about rabies from a colleague. This finding contradicted with the findings by Sambo *et al.*(2014) and Dodet *et al.*(2008) that showed 36% and 70% of common source of information via personal contact like relatives and friends has led to low level of awareness and knowledge of rabies. Therefore, we concluded that source of information had influenced on the level of awareness.

Garg (2014) stated that effective canine rabies vaccination was an important component of rabies control programme. Based on the result showed in **Figure 3**, 76%(n=25) of respondents chose regular vaccination against rabies as an action that could be taken to monitor rabies besides confine the dog, and dog elimination programme. A similar study by Sambo *et al.* in 2014 also showed comparable findings where majority of respondents (67%) recognised that dog vaccination is one of the mechanisms to control rabies, while others thought additional method such as restraining dog and killing suspected dog could also be conducted to control the disease.

Likewise, 76%(n=25) of respondents also choose to vaccinate the dog(s) against rabies as the most effective way to protect human from rabies. This finding was consistent with the application of mass vaccination in dogs practice in Sri Lanka whereby the human rabies incidence per 1 000 000 persons, which was more than 2 in the year 1975, declined to less than 1 in 1985 and less than 0.5 in the year 2005 onwards (Garg, 2014). Furthermore, majority of respondents, 76%(n=25) thought that awareness problem could affect the effectiveness of rabies control programme. Similar statement made by Garg (2014) who mentioned that the major factor for rabies still exist in human and animals was due to lack of awareness about rabies, the risk associated with the disease, and the swift action in the event of an exposure.

Table 5 demonstrated that nine out of twelve (75%) respondents experienced dog bite or scratched aware on the critical component of post-exposure prophylaxis (PEP). PEP is an immediate washing of wound from animal bite or scratch with soap before medical presentation. In electronic survey of 100 persons from all over India, 90% of the respondents agreed that dog bite wound should be washed with soap and water (Garg, 2014). However, all the dog owners in this study did not seek immediate medical treatment after the incidence which is parallel with study by Sambo *et al.* (2014) in Tanzania who showed that 25% of bite victims did not seek medical attention. Garg (2014) also emphasize that people need to be educated on appropriate wound care practices and importance of seeking medical attention.

6.0 CONCLUSION

In conclusion, the level of awareness of rabies as zoonotic disease among majority of dog owners in University Veterinary Hospitals (UVH), Universiti Putra Malaysia was at low grade with value of 85%(n=28). There was a significant association [P value = 0.036; (α = 0.05)] between the source of information with level of awareness of rabies includes social media and mass media as the main source of information about rabies among dog owners. Furthermore, regular vaccination of dog against rabies was the best way to monitor rabies and an effective way to protect human from getting infected with rabies. Majority of dog owners agreed that awareness problem affect the efficacy of rabies control programme. In addition, there was still lack of awareness and inadequate fundamental knowledge of dog owners on wound management which could be a life-saving step to prevent unnecessary deaths due to rabies. Collaboration between different sectors particularly public health, animal health and environmental agencies are essential for awareness of rabies in Malaysia.

7.0 RECOMMENDATION

1. Expand the study in other veterinary hospital/clinics to compare the level of awareness among dog owners in different veterinary hospital/clinics to get better spread of demographics.
2. Improve the study by dividing the study into two phases which involve pre- and post-survey to ensure dog owners acquired sufficient knowledge about rabies and ways to prevent the disease transmission.
3. Conduct a similar study with cat owners and non-pet owners for a comparison.

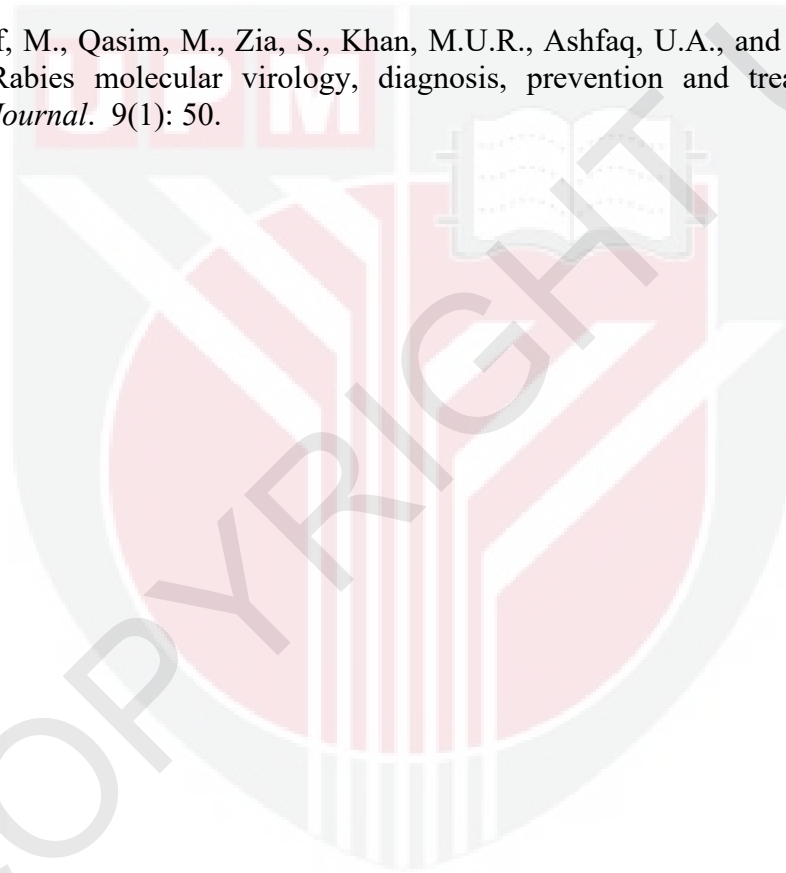
REFERENCES

- Adib, P. (2018). Man, 59, is seventh rabies casualty. *New Straits Times*. Retrieved from <https://www.nst.com.my/news/nation/2018/02/332248/man-59-seventh-rabies-casualty>. Accessed 9 February 2018.
- Center for Disease Control and Prevention. (2017). *Rabies in Malaysia*. Retrieved from <https://wwwnc.cdc.gov/travel/notices/alert/rabies-malaysia>. Accessed 11 October 2017.
- Department of Veterinary Services, Putrajaya. (2016). Daily Report on Rabies Outbreak, Biosecurity Management Division. Accessed 12 October 2017.
- Dodet, B., Goswami, A., Gunasekera, A., Guzman, F.D., Jamali, S., Montalban, C., Ziauddin, A. (2008). Rabies awareness in eight Asian countries. *Vaccine*. 26: 6344-6348.
- Garg, S. R. (2014). *Rabies in Man and Animals*. New Delhi, India: Springer.
- Laura, B. (2015). Rabies outbreak in northern Malaysia ends after vaccination and culling campaigns. Retrieved from <https://rabiesalliance.org/resource/rabies-outbreak-northern-malaysia-ends-after-vaccination-and-culling-campaigns>. Accessed 10 October 2017.
- Murphy, F.A. (2012). Virus images/Foundation of virology. The University of Texas Medical Branch at Galveston, Department of Pathology, Galveston, Texas 77555-0609 USA. Retrieved from <https://www.utmb.edu/virusimages/>. Accessed 9 February 2018.
- Sambo, M., Lembo, T., Cleaveland, S., Ferguson, H.M., Sikana, L., Simon, C., Urassa, H., & Hampson, K. (2014). Knowledge, Attitudes and Practices (KAP) about Rabies Prevention and Control: A Community Survey in Tanzania. *PLoS Negl Trop Dis*. 8(12): e3310.
- Tenzin, & Ward, M.P. (2012). Review of Rabies Epidemiology and Control in South, South East and East Asia: Past, Present and Prospects for Elimination. *Zoonoses and Public Health*. 59: 451-467.

The Center for Food Security & Public Health (2012). Rabies and rabies-related Lyssavirus. 1-10. Retrieved from <http://www.cfsph.iastate.edu/Factsheets/pdf/rabies.pdf>. Accessed 10 October 2017.

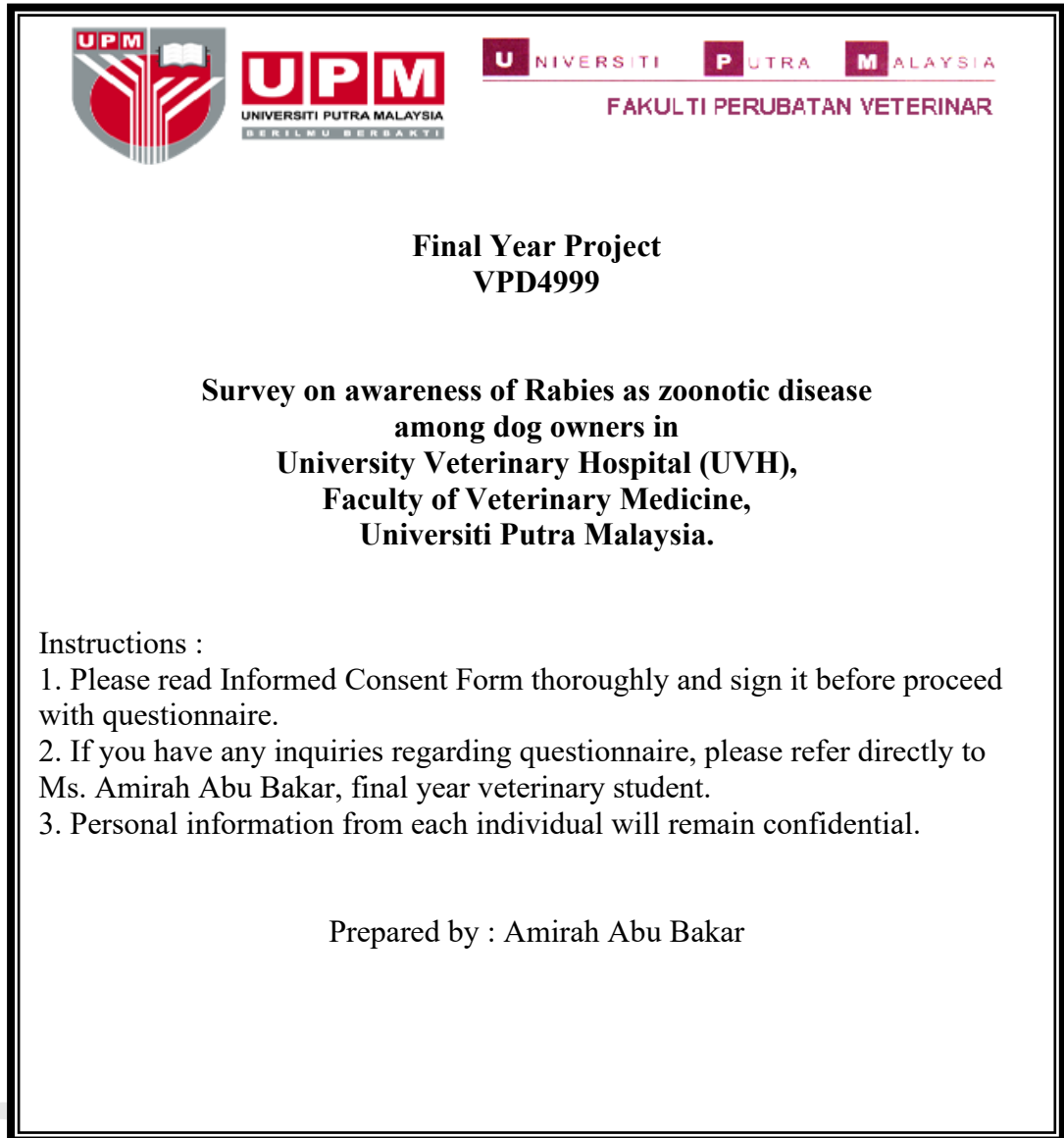
WHO Expert Consultation on Rabies. (2004). WHO Expert Consultation on Rabies: First report. Geneva, Switzerland. pp. 13 – 14. Retrieved from http://apps.who.int/iris/bitstream/10665/43262/1/WHO_TRS_931_eng.pdf. Accessed 1 February 2018.




Yousaf, M., Qasim, M., Zia, S., Khan, M.U.R., Ashfaq, U.A., and Khan, S. (2012). Rabies molecular virology, diagnosis, prevention and treatment. *Virology Journal*. 9(1): 50.



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APPENDIX I



  
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI
FAKULTI PERUBATAN VETERINAR

**Final Year Project
VPD4999**

**Survey on awareness of Rabies as zoonotic disease
among dog owners in
University Veterinary Hospital (UVH),
Faculty of Veterinary Medicine,
Universiti Putra Malaysia.**

Instructions :

1. Please read Informed Consent Form thoroughly and sign it before proceed with questionnaire.
2. If you have any inquiries regarding questionnaire, please refer directly to Ms. Amirah Abu Bakar, final year veterinary student.
3. Personal information from each individual will remain confidential.

Prepared by : Amirah Abu Bakar

Figure 7 : Front page of questionnaire, English language

APPENDIX II

Section A	
(Please tick <input type="checkbox"/> to the provided space)	
1. Gender	: <input type="checkbox"/> Male <input type="checkbox"/> Female
2. Age	: <input type="checkbox"/> 20-29 years old <input type="checkbox"/> 30-39 years old <input type="checkbox"/> 40-49 years old <input type="checkbox"/> ≥50 years old
3. Highest Education Level	: <input type="checkbox"/> SPM <input type="checkbox"/> STPM/Diploma <input type="checkbox"/> Undergraduate <input type="checkbox"/> Postgraduate <input type="checkbox"/> Other(please specify): _____
4. Occupation	: <input type="checkbox"/> Government worker <input type="checkbox"/> Non-government worker <input type="checkbox"/> Self-employed <input type="checkbox"/> Student <input type="checkbox"/> Other(please specify): _____

Figure 8 : Section A of questionnaire, demographic of respondents

APPENDIX III

Section B	
(Please tick \checkmark to the provided space. Please choose one only)	
1. Have you heard about Rabies?	
<input type="checkbox"/> Yes	<input type="checkbox"/> No * <i>Proceed to Q.3</i>
2. Where do you learn/know about Rabies?	
<input type="checkbox"/> Colleague	
<input type="checkbox"/> Social Media (eg. Facebook)	
<input type="checkbox"/> Mass Media (eg. Newspaper)	
<input type="checkbox"/> Education (eg. Attend rabies awareness programme)	
<input type="checkbox"/> Other(please specify): _____	
3. Do you think Rabies is dangerous to humans?	
<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Is Rabies treatable in human and animal?	
<input type="checkbox"/> Yes	<input type="checkbox"/> No * <i>Proceed to Section C</i>
5. What treatment can be given?	
<input type="checkbox"/> Modern treatment (eg. medicine prescribed by doctor)	
<input type="checkbox"/> Homemade remedy	
<input type="checkbox"/> Both above	
<i>[If you have answer Q.5, please proceed to Section D and Section E]</i>	

Figure 9 : Section B of questionnaire, awareness of rabies

APPENDIX IV

Section C

(Please tick \checkmark to the provided space and choose one answer only for multiple choice questions)

1. In which animal is Rabies more likely to be found in Malaysia setting?

A. Dog	C. Wild animal
B. Cat	D. Do not know* <i>Proceed to Q.4</i>

2. How can human get infected with Rabies?

A. Bite	D. Eating raw meat
B. Saliva	E. Drinking raw milk
C. Inhalation	

3. Which of these are symptoms of rabies in animals?

A. Loss of appetite	D. Trembling
B. Become aggressive	E. All of options
C. Choking sounds	

4. The signs of rabies are almost the same in animals and humans.

<input type="checkbox"/> Yes	<input type="checkbox"/> No* <i>Proceed to Q.7</i>
------------------------------	--

5. Which of the following is not a symptom of Rabies infection in humans?

A. Diarrhoea	D. Appearing restless and aggressive
B. Fear of water and bright light	E. All of options
C. Pain at the wound site	

6. How soon do symptoms typically appear after a person is infected with Rabies?

A. 48 hours	C. 1 month
B. 1 week	D. 1 year

7. If an owner notices a change in the behaviour of their dog, the owner should do the following:

A. Take the dog to veterinarian	D. Drop the dog off at animal shelter
B. Visit a traditional healer	
C. Take the dog to a family who has time to care for the dog	

Figure 10 : Section C of questionnaire, knowledge about rabies

APPENDIX V

Section D
(Please tick \checkmark to the provided space and choose one answer only for multiple choice questions)

1. Have your dog(s) been vaccinated?
 Yes No**Proceed to Q.4*

2. Who vaccinated your dog(s)?
 A. Private veterinarian C. Mass vaccination
 B. Government veterinarian D. Other(please specify):

3. Have your dog(s) been vaccinated against Rabies?
 Yes**Proceed to Q.5* No**Proceed to Q.4*

4. Why haven't you vaccinated your dog(s)?
 A. Expensive C. I have no reason
 B. Didn't know about it D. The veterinary clinic is far

5. Which action can be taken to monitor Rabies?
 A. Regular vaccination C. Dog elimination
 B. Confine the dog D. Do not know

6. Which of the following affect effectiveness of Rabies control program?
 A. Awareness problem C. Lack of budget
 B. Lack of vaccine D. Do not know

7. The most effective way to protect yourself and your family from rabies:
 A. Having you dog(s) vaccinated agaিসnt Rabies
 B. Ensuring family members are vaccinated against Rabies
 C. Not owing any pets
 D. None of the above answers are correct

Figure 11 : Section D of questionnaire, dog vaccination programme

APPENDIX VI

Section E

(Please tick \checkmark to the provided space and choose one answer only for multiple choice questions)

1. Have you been bitten or scratched by dog(s)?
 Yes No **Proceed to Q.5*
2. What action did you take immediately after being bitten or scratched?
 A. Washed wound with water and soap
 B. Did not do anything
 C. Apply traditional medicine
 D. Bandage the wound
 E. Took painkiller
3. Did you seek immediate treatment after dog bite?
 Yes No **Proceed to Q.5*
4. Which facility did you go to?
 A. Traditional healer
 B. Private clinic
 C. Spiritual healer
 D. Government hospital
5. If a person is bitten, they should:
 i. Immediately go to a laboratory to be tested for rabies
 ii. Immediately wash the wound with soap and running water for 15 minutes
 iii. Go to medical facilities (eg. clinic, hospital)
 A. Do ii and then i
 B. Do both ii and iii
 C. Only do iii
 D. All of the above options are correct
6. The use of traditional remedies to treat a wound could result in an infection.
 Yes No

*You have reached end of questionnaire
 Thank you for your time and cooperation*

Figure 12 : Section E of questionnaire, healthcare-seeking behaviour in dog owners

APPENDIX VII

<p>Ref. no: UPM/TNCPI/RMC/JKEUPM/1.4.18.2 (JKEUPM)</p> <p>Date: 19/1/2018</p> <p>Dear Prof/Dr. /Mr. / Ms.,</p> <p>APPLICATION FOR JKEUPM ETHICAL CLEARANCE: APPROVED</p> <p>With reference to the above, I am pleased to inform you that your application for ethical clearance for the research project entitled ‘Survey on Awareness of Rabies as zoonotic disease among dog owners in University Veterinary hospital (UVH), Faculty of Veterinary Medicine, Universiti Putra Malaysia’ has been approved.</p> <p>Please note that the official letter of approval will be issued as soon as possible. However, the ethical clearance is considered effective from the date of this email, and you may now proceed with your research.</p> <p>Kindly please remind the ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.</p> <p>Researchers should also complete a Study Final Report upon study completion. The form can be obtained from the Ethics Committee for Research Involving Human Subjects (JKEUPM) website (http://www.rmc.upm.edu.my/documentfile).</p> <p>If you have any enquiries, please contact Ms. Nursuraya (03-89471605) or Ms. Nor Ellia (03-89471244).</p> <p>Note: Please use this reference number for any transaction. -JKEUPM-2017-289</p> <p>Thank you.</p> <p>Yours faithfully,</p> <p>Prof. Dr. Zamberi Sekawi Chair Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia</p>

Figure 13 : Approval letter from Ethics Committee for Research Involving Human Subjects (JKEUPM)

APPENDIX VIII

CONSENT FORM	
I	Identity Card No.
address.....	
.....hereby voluntarily agree to take part in the research stated above *(clinical /drug trial/video recording/ focus group/interview-based/ questionnaire-based).	
I have been informed about the nature of the research in terms of methodology, possible adverse effects and complications (as written in the Respondent's Information Sheet). I understand that I have the right to withdraw from this research at any time without giving any reason whatsoever. I also understand that this study is confidential and all information provided with regard to my identity will remain private and confidential.	
I *wish / do not wish to know the results related to my participation in the research	
I *agree/do not agree that the images/photos/video recordings/voice recordings related to me be used in any form of publication or presentation (if applicable)	
* delete where necessary	
Signature :..... (Respondent)	Signature :..... (Witness)
Date :.....	Name :.....
I/C No. :.....	
I confirm that I have explained to the respondent the nature and purpose of the above-mentioned research.	
Date :.....	Signature :..... (Researcher)

Figure 14 : Informed consent form (JKEUPM format)

APPENDIX IX

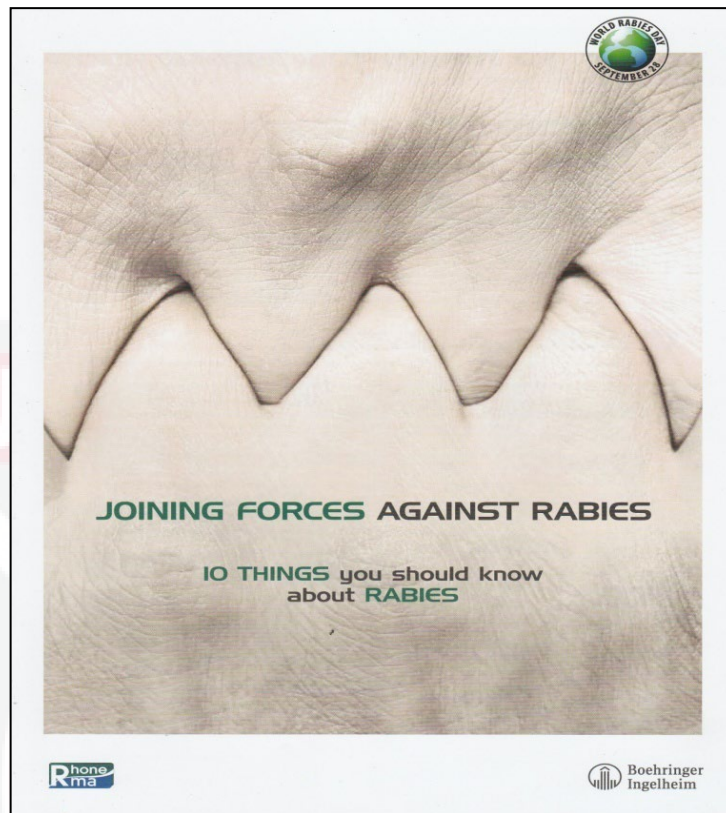


Figure 15(a) : Rabies pamphlet



Figure 15(b) : "Rabisin" pen & stylus