UNIVERSITI PUTRA MALAYSIA

KNOWLEDGE, ATTITUDE AND PRACTICE (KAP) REGARDING CANINE RABIES AMONG COMMUNITY MEMBERS OF KLANG VALLEY, MALAYSIA

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By

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LIST OF ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
DFAT	Direct fluorescent antibody test
FRDD	Free-roaming domestic dogs
FYP	Final Year Project
KAP	Knowledge, Attitude and Practice
PCR	Polymerase Chain Reaction
PEP	Post-exposure prophylaxis
RABV	Rabies Virus
SEA	Southeast Asia
UPM	Universiti Putra Malaysia
WHO	World Health Organization

ABSTRACT

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

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2022

Supervisor: Dr. Mazlina Mazlan

Co-supervisor: Assoc. Prof. Dr. Lau Seng Fong

Rabies is a neglected zoonotic viral disease responsible for the deaths of approximately 59,000 people per year globally, with almost 99% of human cases being caused by dogs. In April 2022, Selangor, Malaysia had reported its first two human rabies cases. Therefore, this cross-sectional study was conducted to evaluate the knowledge, attitude, and practices (KAP) regarding canine rabies among community members of Klang Valley, Malaysia which can be useful to identify the obstacles in the prevention and control scheme of rabies. Between August and September 2022, a total of 201 respondents took part in the online survey conducted through Google Forms using a structured questionnaire. The data were then analyzed using SPSS statistical software version 26. Then, the factors associated with KAP level were analyzed using Pearson chi-square. Majority of the respondents had high knowledge (65.7%, n = 132), positive attitude (75.1%, n = 151) and good health seeking behavior if bitten by a dog (64.7%, n = 108), but bad health seeking behavior for those with a history of dog bites (88.2%, n = 30). The KAP level is found to be associated with having veterinary medicine or medical background, age, ethnicity, type of house, the relationship to the head of household, and having dog(s) as pets (*p*

< 0.05). Households with owned dog(s) (n = 55) showed that they sometimes (20.0%, n = 11), while a few said always (3.6%, n = 2) allow their dogs to roam freely outside without supervision. It is also found that 23% (n = 13) of respondents do not vaccinate their dog(s) against rabies. In conclusion, the level of KAP regarding canine rabies among residents of Klang Valley was suboptimal. Therefore, it is vital to carry out programmes aiming at raising public awareness of rabies and enhancing post-exposure prophylactic habits.

Keyword: *Rabies; KAP; zoonotic; canine*

ABSTRAK

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

PENGETAHUAN, SIKAP DAN AMALAN TERHADAP RABIES KANIN DALAM KALANGAN AHLI MASYARAKAT LEMBAH KLANG, MALAYSIA

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Rabies ialah penyakit zoonotik yang terabai yang disebabkan oleh virus dan bertanggungjawab terhadap kematian kira-kira 59,000 orang setahun di seluruh dunia, dengan hampir 99% kes manusia disebabkan oleh anjing. Pada April 2022, Selangor, Malaysia telah melaporkan dua kes pertama rabies manusia. Oleh itu, kajian keratan lintang ini dijalankan untuk menilai pengetahuan, sikap, dan amalan (KAP) terhadap rabies anjing dalam kalangan anggota masyarakat Lembah Klang, Malaysia yang akan berguna untuk mengenal pasti halangan dalam pencegahan dan kawalan rabies. Antara bulan Ogos dan September 2022, seramai 201 responden telah mengambil bahagian dalam tinjauan dalam talian yang dijalankan melalui Google Form, menggunakan soal selidik berstruktur. Data tersebut kemudiannya dianalisis menggunakan perisian SPSS versi 26. Kemudian, faktor sosiodemografi yang berasosiasi secara signifikan dengan

tahap KAP dianalisis menggunakan Pearson chi-square. Majoriti responden mempunyai pengetahuan yang tinggi (65.7%, n = 132), sikap positif (75.1%, n = 151), tetapi tingkah laku kesihatan yang buruk jika digigit anjing (64.7%, n = 108), dan mereka yang mempunyai sejarah gigitan atau cakaran anjing (88.2%, n = 30). Tahap KAP didapati beraosiasi secara signifikan dengan lataar belakang perubatan atau doktor perubatan, umur, etnik, jenis rumah, hubungan dengan ketua isi rumah, dan mempunyai anjing sebagai haiwan peliharaan ($p < 0.05$). Isi rumah yang memelihara anjing (n = 55) menunjukkan bahawa mereka kadangkala membenarkan anjing mereka berkeliaran dengan bebas di luar tanpa pengawasan (20.0%, n = 11), manakala segelintir lagi mengatakan selalu melakukan perbuatan tersebut (3.6%, n = 2). Ia juga didapati bahawa 23% (n = 13) daripada responden yang memelihara anjing tidak vaksin anjing mereka terhadap rabies. Kesimpulannya, tahap KAP berkenaan rabies anjing dalam kalangan penduduk Lembah Klang adalah suboptimum. Oleh itu, adalah penting untuk menjalankan program yang bertujuan untuk meningkatkan kesedaran orang ramai tentang rabies dan meningkatkan tingkah laku kesihatan selepas terdedah kepada penyakit rabies

Kata kunci: *Rabies; KAP; zoonotik; kanin*

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CHAPTER 1

INTRODUCTION

Rabies is a zoonotic viral disease caused by the family *Rhabdoviridae* and genus *Lyssavirus*. It is responsible for the deaths of approximately 59,000 people per year worldwide (Ubeyratne et al., 2021), mainly in developing countries. In Malaysia, free-roaming dogs are the primary reservoirs that can transmit to humans through dog bites, causing an infectious disease of the central nervous system. Despite the fact that dog bites have been the source of all known human cases of rabies in Sarawak, cats and dogs have tested positive for the rabies virus by PCR. Bats, raccoons, skunks, and foxes are some other species that have been implicated in spreading the rabies virus (Sim et al., 2021).

Since 1924, human rabies cases have been documented in Peninsular Malaysia and most of these cases were recorded in states that are adjacent to Thailand, one of the rabies endemic countries (Ahmed & Ibrahim, 2019). Then, multiple rabies outbreaks were reported in Province Wellesley and Perak (1945), followed by Selangor in 1952 with a total of 25 human deaths. The reoccupation by Allied forces in late 1945 caused a dramatic increase in cases, since many soldiers brought their dogs with them from India. Although Malaysia was declared rabies-free in 2013, following the National Rabies Control Programme, a major outbreak occurred in 2017, taking place in Sarawak, with a reported 32 human deaths (Izani et al., 2022).

Similarly, multiple outbreaks were reported in northern Peninsular Malaysia, such as Perlis, Kedah, Penang and Perak (Navanithakumar et al., 2019) from the year 2017 until 2019. The Pulau Penang outbreak was thought to have spread from neighbouring Thailand via fishermen's boats, whereas the outbreaks in Perlis and Kedah were thought to have spread via land transportation (Ahmed & Ibrahim, 2019). Notably, the first rabies outbreak in Terengganu, Malaysia, occurred in 1996, was likewise caused by dogs from Thailand that had been carried there by fishermen on their boats. Additionally, the northern states of Peninsular Malaysia that border Thailand have

been the only ones to record rabies cases between 2015 and 2018, demonstrating the significance of the "immune belt" in containing the disease.

Leow et al. (2021) described that phylogenetic examination of the N gene allows for the classification of Rabies virus (RABV) into six groups: the Africa 2, Africa 3, Arctic-related, Asian, Cosmopolitan, and Indian subcontinent clades. All of the RABVs in Malaysia were found to belong to the Asian clade, suggesting that they are closely related to other RABVs found in the region. The RABVs found in Perlis and Kedah belong to the Asian II lineage, which is also represented by viruses found in Thailand, Myanmar, Laos, Cambodia, and Vietnam. In the same vein, the virus found in Sarawak is extremely similar to those found in the neighboring region Kalimantan (Indonesia).

Each year, tens of thousands of individuals will die due to rabies, with the majority being children. Most are impoverished, lack access to modern medical treatment, and will die unrecorded, frequently at home in a rural town (Rupprecht et al., 2017). Léchenne et al. (2019) illustrated that Myanmar, Indonesia, Pakistan, India, and Bangladesh are the only Asian nations that do not consider rabies to be a reportable disease. However, even in nations where rabies is reportable, such as Malaysia and Cambodia, the surveillance system is either inadequate or non-existent across the country. A study conducted by Sim et al. (2021) reported their findings were concerning due to the general's public lack of knowledge regarding dog bites and timely management, which can significantly lower the risk of mortality when done correctly and quickly. Furthermore, other studies in Asia (Malaysia excluded) have shown similar findings in which there is a lack of rabies awareness among the Asian population and a delay in receiving the necessary treatment.

However, despite the fact that there are countless cases of rabies that occur each day in wild animals, domestic animals, and humans, only a very small percentage of those cases are actually diagnosed. Due to the lack of funding, no new cases are being identified, perpetuating a vicious cycle that obscures the true extent of the disease's toll. Rabies is entirely a preventable disease with rigorous prevention and control

programmes, including public awareness and knowledge, especially among dog owners. Therefore, the purpose of this study is to investigate the Knowledge, Attitude and Practices (KAP) for rabies among the participants from Klang Valley to reveal the knowledge gaps that may impair rabies preventative strategies in the case of outbreak.

The specific objectives were:

1. To assess the level of knowledge, attitude and practices (KAP) among community members of Klang Valley, Malaysia on canine rabies, dog bite treatment, and prevention in Klang Valley, Malaysia.
2. To identify the risk factors associated with canine rabies occurrence in Klang Valley, Malaysia.

Research hypotheses of this study were:

1. There is a significant relationship between sociodemographic factors of Klang Valley, Malaysia community with their knowledges scores, attitudes and practices on canine rabies, dog bite treatment, and prevention
2. There are specific risk factors and pathways linked to canine rabies in Malaysia

CHAPTER 2

LITERATURE REVIEW

1.1 Dog population in Malaysia

Dogs are an integral component of everyday life due to their invaluable services to society and their positive effects on human mental health and wellbeing and thus, making them great as pets. The pet dog population in Malaysia is reported to be 423,000 in the year 2021 and believed that the number will increase to 465,000 in 2025 (Zhiduo, 2021). Currently, there are no available data on the number of free-roaming dogs in Malaysia, but Smith et al. (2019) reported that free-roaming dogs account for approximately 75% of the worldwide domestic dog population.

1.2 Zoonoses associated with dogs

1.2.1 Definition of zoonoses

A zoonotic disease can be defined as an infectious disease that can spread from nonhuman animals to humans and may be caused by bacterial, viral, parasitic, or unconventional agents (World Health Organization [WHO], 2020). Transmission of zoonoses may include direct contact with the animal, indirect contact, vector-borne, foodborne, and waterborne (Centers for Disease Control and Prevention [CDC], 2021). Zoonotic diseases are estimated to be responsible for 60% of all infectious disease pathogens and 75% of all emerging pathogens worldwide (Teshome, 2019).

1.2.2 Common zoonoses related to dogs

In areas with a high number of free-roaming dogs, there are substantial risks imposed on the general public's health as well as on the welfare of animals, and wild animals (Smith et al., 2019). It has been reported that dogs are associated with over 60

zoonoses (Hughes & Macdonald, 2013). Rabies is the most serious of these zoonoses in terms of public health due to its fatality (Acharya et al., 2020), and it is estimated that rabies has been responsible for the deaths of around 59,000 people across the world (Ward & Brookes, 2021).

Otranto et al. (2017) stated that zoonotic dog-related parasitic infections are a significant public health concern globally, not just in developing countries. For instance, intestinal hookworm disease, caused by the agent *Ancylostoma ceylanicum*, is an important zoonosis in the tropical Asia-Pacific region. Apart from this, human toxocariasis is also a concern in Southeast Asia (SEA), as the overall seroprevalence is reported to be varied from 6.0% up to 84.6% based on the seroprevalence studies done from 1992 to 2019 (Chou & Fan, 2020). It was discovered that the prevalence of *Toxocara spp*. infections in stray dogs were significantly greater than in stray cats.

Several vector-borne zoonotic pathogens associated with dogs have been found in SEA, such as *Rickettsia felis*, an emerging bacterial pathogen, with *Ctenocephalides felis* being the main vector and reservoir (Nguyen et al., 2021). Furthermore, dogs have recently been shown to be effective vertebrate reservoir hosts for *R. felis*, with the infection resulting in primarily subclinical symptoms (Ng-Nguyen et al., 2020). Mosquitoes are also known vectors for zoonotic filarial nematodes, *Dirofilaria immitis* and *Dirofilaria repens*, which cause heartworm and subcutaneous diseases in animals and humans, respectively (Nguyen et al., 2021).

1.2.3 Risk factors of zoonotic diseases

Multiple identified factors may be potential drivers in the transmission of zoonotic disease, such as expanding human population, globalization, climate change and occupational hazards. Global population growth will continue to rise and is believed to reach 8.5 billion by 2030 (United Nations, n.d.). This will be accompanied by an increase in food demand which leads to agricultural intensification that will require more significant land usage, which eventually destroys wildlife habitats and elevated

human exposure to wildlife-related zoonosis (Singh & Gajadhar, 2014). On top of that, economic globalization plays an essential role in the spread of zoonotic pathogens to non-endemic countries due to the movement of a significant number of individuals around the world consequent to the convenience and accessibility of air travel, and importation of fresh produce and live animals globally (Gordon et al., 2016).

Urbanization and globalization have led to a series of cascading effects that are detrimental to the environment, resulting in climate change. As a result, the host range, reservoirs, and vector base of a zoonotic pathogen are expanding, leading to a greater risk to the public health (Singh & Gajadhar, 2014). For instance, *Onchocerca lupi*, a filarial nematode, was first discovered in wolves, however, it has since been discovered in domestic dogs as well (Gordon et al., 2016).

Jayanthi and Raja (2021) wrote that occupational risks can be broken down into three categories: biological (e.g., bacteria, fungi, viruses), physical (e.g., significant injuries, and trauma due to contact with animals) and chemical hazards (e.g., chemicals, medicines, anesthetic gases). It has been proven that any form of occupational relationship with animals will be more at risk of contracting zoonotic disease. Vonesch et al. (2019) reported that individuals engaged in activities involving animals or animal products such as farmers, veterinarians and abattoir workers are more at risk of obtaining Crimean-Congo Hemorrhagic Fever (CCHF) disease and Hepatitis E virus (HEV) infection.

1.3 Rabies

1.3.1 Epidemiology of Rabies

Rabies is a fatal zoonotic disease caused by a neurotropic rabies virus (RABV) in the genus *Lyssavirus*, family Rhabdoviridae (Barecha et al., 2017). The two main genetic lineages of the rabies virus are New World bat and canine, each can be further subdivided into RABV variants depending on the reservoir species in which they

circulate (Wallace et al., 2020). It is reported that canine rabies remains enzootic in many regions of the world, including Africa, Asia and Latin America, and a majority of these enzootic countries experience lower infrastructural development in and a high proportion of free-roaming dogs (Barecha et al., 2017; Smith et al., 2019). WHO (2017) stated that Asia and Africa account for 95% of all rabies cases and approximately 99% of all rabies cases are dog-mediated.

1.3.2 Rabies in man and animals

Transmission of rabies can occur through direct contact (e.g. through skin injuries or mucous membranes) with saliva or nervous system tissue of an infected animals. However, a majority of human rabies cases are due to the bite of a rabid animal (CDC, 2019). Transmission of this disease between individuals is rare, but a few rabies cases were documented as a result of organ transplants (Bano et al., 2016).

1.3.3 Isolation and identification of Rabies virus

According to Duong et al. (2016), the gold-standard diagnostic technique for rabies is by demonstration of rabies virus antigen in either fresh or fixed brain tissue samples by the direct fluorescent antibody test (DFAT) which provides high sensitivity and specificity. A fluorescein isothiocyanate-conjugated (FITC) anti-rabies monoclonal antibody reagent is used in DFAT that will stain the RABV antigen (Prabhu et al., 2018). Following staining with the reagent, absorbent paper is used to remove excess conjugate and immersed in PBS for 3–5 minutes to rinse the slides. Excess liquid was removed by blotting the slides, and after a quick air dry, the slides are examined using a fluorescence microscope. Nevertheless, result interpretation requires expert personnel and an expensive fluorescence microscope (Duong et al., 2016).

In a recent study, Tenzin et al. (2020) demonstrated that the commercially available rabies rapid test kits developed by BioNote, Inc. (Hwaseong-si, Korea) are highly

sensitive and specific which can benefit in terms of rabies surveillance and confirming clinical cases.

1.4 Knowledge regarding Rabies

A household cross-sectional study was conducted among the urban and rural population of Rawalpindi and Islamabad, Pakistan with the purpose to investigate the degree of Knowledge, Attitude and Practices (KAP) for rabies. It is found that 48.8% of the participants have heard of rabies through various platform, such as through internet, broadcast media and print media. Despite the high level of awareness, 38.7% of total participants were unaware of any rabies symptoms or signs. Furthermore, a majority of them, 93.3%, knew that rabies is mainly spread by dogs, and 62.9% do know that humans can be infected with rabies if bitten by a rabid dog (Khan et al., 2019).

A self-designed questionnaire was also used to perform a face-to-face interview to conduct a cross-sectional study to look into the rabies KAP of animal bite victims in Wuhan, China. It is found that most of the respondents identified that both cats and dogs can transmit rabies virus, but only 56.85% of total respondents were able to identify that rabies is an infectious disease. The study also showed that only 58.72% knew that rabies is a fatal disease, and 15.76% did not know the severity of rabies disease. It is demonstrated that the knowledge of rabies was significantly influenced by educational level. The higher the educational level, the higher the knowledge score (Li et al., 2021).

Another KAP survey of canine rabies was done in Punjab and Khyber Pakhtunkhwa, province of Pakistan. The results of the study revealed that 72.4% of the total respondents knew of rabies deadly nature. However, the number of rural residents (75%) that are aware of the fatality of rabies is more compared to the urban residents (67%). The same study also showed that education level and rabies awareness were positively correlated, but negative correlation between education level and seeking medical care for a suspected bite was discovered (Ahmed et al., 2020).

1.5 Attitude towards Rabies

In a cross-sectional study done to evaluate the KAP regarding rabies in the El Jadida region, Morocco, it was discovered that 30% of total respondents thought that dogs should be able to roam freely. In addition, 64.9% agreed that dogs should search freely for food and 52.1% of them stated they had no problem feeding unknown dogs (Bouaddi et al., 2020).

In a previous study conducted in Songan Village, Bali, Indonesia, it was reported that respondents with increased awareness of rabies is highly associated with positive attitudes and good practices in regards to rabies. The results also showed that white-collar workers had an increased odds of having high levels of KAP than those who were not employed (OR 4.053 and 20.146), the same results applied for blue-collar workers compared to those who were not employed (R 5.864 and 12.068). Therefore, it was observed that one's occupation considerably affects one's level of KAP (Christopher et al., 2021).

According to Savadogo et al. (2022), the knowledge level of rabies was significantly associated with attitude towards rabies ($p<0.05$). In the same study, relationships were found between attitude and educational attainment, neighbourhood area and the health care district. Furthermore, 76.4% of the respondents stated that they would kill a suspected rabid animal while only 20.8% would contact the local authority in response to a suspected rabid animal.

1.6 Practice towards Rabies

A study conducted to investigate the KAP among the rural community in Gondar Zuria District, Ethiopia, reported that 41.5% of total respondents had a history of dog bite at least once. Nonetheless, only 30.7% of them practiced the first-aid technique of cleaning the wound with water or soap and water to avoid rabies whereas others used traditional medicine, went to health facilities, or chose to not do anything (Digafe et al., 2015).

In another cross-sectional study, researchers found that most of the respondents stated that they practice washing the wound as first aid (65.49%) and taking post-exposure vaccination (64.40%) following a dog bite. Nevertheless, there are still a number of dog bite victims (18.21%) sought out a traditional healer after receiving first aid. Moreover, to avoid being bitten by a dog, 79.08% of the respondents said that suspected rabid dogs should be chained up all day; just 15.49% said that these dogs should be put down right away (Rahaman et al., 2020).

Another study was carried out in Abuja Municipal Area Council, Nigeria to assess the community-based KAP. After being bitten by a dog, it is found that more than 86% of the respondents would visit a hospital or a doctor for treatment which reflects the level of knowledge on rabies. Besides that, the proportion of people who vaccinated their dogs against rabies (94.3%) and other diseases (94.3%) demonstrates good practice and responsible dog ownership. In the same study, it is reported that dog owners had a 75% of satisfactory practice against rabies (Edukugho et al., 2018).

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter, the material and methods used in this study were discussed. Study location and population, study designs, questionnaire design, data collection and analysis were described.

3.2 Study location and population

The study was conducted in Klang Valley, Malaysia which comprised of seven districts: Kuala Lumpur, Gombak, Hulu Langat, Kuala Langat, Petaling Jaya, Klang and Sepang. These locations were chosen due to the two human rabies cases reported in Petaling Jaya and Kuala Langat district recently in 2022. The first case involved a 40-year-old-man who was found dead at his house on March 10th 2022, and the rabies diagnosis was confirmed upon post mortem on April 4th 2022. Subsequently, the second rabies case involved a 85-year-old-man with a history of a dog bite approximately two months ago, in which cerebrospinal fluid sample and nuchal biopsy were taken and confirmed positive for rabies on 22nd April 2022. Besides that, there is a paucity of baseline data which will be needed for effective rabies surveillance in Klang Valley

3.2.1 Selection criteria

3.2.1.1 Inclusion criteria

Residents of Klang Valley residing in any of the seven districts: Kuala Lumpur, Gombak, Hulu Langat, Kuala Langat, Petaling Jaya, Klang and Sepang. Participants were at least 18 years of age.

3.2.1.2 Exclusion criteria

Non-resident of Klang Valley or aged below 18 years old.

3.3 Sample size and sampling technique

A convenient minimum sample size of 217 was used for the study. The sampling technique used in this study was convenience sampling in which the survey was accessible to the general public and involved participation from any individual, also known as unrestricted self-selected surveys.

3.4 Study design

This study design was a cross-sectional online survey conducted between August and October, 2022, using a structured and pre-tested questionnaire to determine the KAP level regarding canine rabies among Klang Valley residents. To rule out any potential for personal, social, or cultural conflict, the questionnaire was piloted with a small sample of people. Furthermore, the responder's participation was entirely voluntary, and their answers were kept confidential.

3.5 Questionnaire design

To achieve all research objectives, a structured questionnaire including both open-ended and closed-ended questions was designed to obtain data for the study through a web-based survey tool, Google Forms. The structured questionnaire comprised of three sections; A) sociodemographic data, B) household dog population dynamics and welfare, and C) knowledge of rabies transmission, clinical signs, treatment, prevention and control.

3.5.1 Section A: Sociodemographic data

Sociodemographic background of the respondents included the district, gender, age, ethnicity, citizenship status, marital status, occupation, type of housing, relationship to the head of household, ownership status of the house, and total number of people living in the household.

3.5.2 Section B: Household dog population dynamics

Questions regarding dog owning status and history of households, dog characteristics (i.e. age, breed, rabies vaccination status, neuter status), and dog welfare.

3.5.3 Section C: Knowledge of rabies transmission, clinical signs, treatment, prevention and control

In this section, there are three subsections as the followings:

- Knowledge regarding rabies, such as transmission pathways, prevention and control of rabies.
- Attitude, such as participants attitude towards rabies prevention and control.
- Practices, such as responsible behavior to seek appropriate health care, hygiene practices and, responsible dog ownership.

3.6 Data collection

Data collection was performed in September, 2022 through an open online survey.

3.7 Data analysis

Data analysis was done with IBM Statistical Package for Social Sciences (SPSS) software version 28.0. Categorical data were described using frequency and percentage. Chi-squared test was used to determine the association between the sociodemographic factors and KAP scores, with a p-value < 0.05 considered to be

statistically significant. Pearson Chi-Square residual analysis were performed to determine which cell contributed to the significance seen in the association test results, with a value of >2 considered to contribute to the significant association. Next, Spearman's Rank Correlation coefficient was done between non-normally distributed variables, which were knowledge and health-seeking behavior.

3.8 Ethical consideration and consent

The study was reviewed and approved by the Ethics Committee for Research Involving Human Subjects (JKEUPM), Universiti Putra Malaysia (Ref: JKEUPM-2022-490). Consent was also obtained from the participants before data collection.

CHAPTER 4

RESULTS

4.1 Test for Normality

The distribution of knowledge, attitude, and practice regarding canine rabies scores were identified for normality using Kolmogorov-Smirnov which is more appropriate for n ≥50. As p-value is lesser than 0.005 which is statistically significant (Table 1), the null hypothesis was rejected which means the data were not normally distributed.

Table 4.1: Normality Test

Items	**Kolmogorov-Smirnov**		
	Statistic	**df**	**p-value**
Knowledge Scores	0.169	201	<0.001
Attitude Scores	0.116	201	<0.001
Health Seeking Behaviour Score (Respondents with Dog Bite/Scratch History)	0.523	34	<0.001
Health Seeking Behaviour Score (Respondents with No Dog Bite/Scratch History)	0.416	167	<0.001

4.2 Sociodemographic characteristics of respondents in Klang Valley

Table 4.2 represented the sociodemographic characteristics of the respondents in Klang Valley. Majority of the respondents were females (68.7%, n = 138) and about half of them were within the age range between 18 to 25 (59.2%, n = 119) and of Malay ethnicity (54.2%, n = 109). Most of the respondents were Malaysians (97.5%, n = 196) and never married (65.7%, n = 132). Approximately half of the respondents are not working (51.7%, n = 104), students (46.8%, n = 94) and considered as the child to the head of the household (46.3%, n = 93). Almost three quarters of the respondents were not working or studying in the Veterinary or Medical fields (72.6%, n = 146).

Nearly half of the respondents lived in town house, terrace, link house, cluster (45.8%, n = 92), and 71.6% (n = 144) of the participants lived in owned houses. Most of the respondents were from a household size of 4 (25.9%, n = 52) and 5 (24.9%, n = 50). Majority of the respondents were non-dog owners (72.6%, n =146).

Table 4.2: Sociodemographic characteristics of the respondents in Klang Valley (n = 201)

Variables		Frequency	%
District	Gombak	15	7.5
	Hulu Langat	35	17.4
	Klang	18	9.0
	Kuala Langat	10	5.0
	Kuala Lumpur	31	15.4
	Petaling Jaya	71	35.3
	Sepang	21	10.4
Gender	Female	138	68.7
	Male	63	31.3
Age	18 – 25	119	59.2
	26 – 33	35	17.4
	34 – 41	18	9.0
	42 – 49	14	7.0
	50 or older	15	7.5
Ethnicity	Chinese	63	31.3
	Indian	24	11.9
	Malay	109	54.2
	Others	5	2.5
Citizenship	Malaysian	196	97.5
	Non-Malaysian Citizen	2	1.0

	Permanent resident of Malaysia	3	1.5
Marital Status	Divorced	3	1.5
	Living with partner	4	2.0
	Married	60	29.9
	Never married	132	65.7
	Widow/ Widower	2	1.0
Working	No	104	51.7
	Yes	97	48.3
Occupation	Government employee	12	6.0
	Private employee	54	26.9
	Self-employed	22	10.9
	Semi-government employee	11	5.5
	Student	94	46.8
	Unpaid family worker	5	2.5
	Unpaid worker	3	1.5
Working or studying in Veterinary medicine or Medical field	No	146	72.6
	Yes	55	27.4
Relationship to the head of household	Brother- or Sister-in-law	1	0.5
	Child	93	46.3
	Friend	5	2.5

	Grand- or great-grandchild	2	1.0
	Grand- or great-grandparen	6	3.0
	Head of Household	25	12.4
	Other relatives	1	0.5
	Others	10	5.0
	Parent	27	13.4
	Parent-in-law	1	0.5
	Siblings	7	3.5
	Son- or Daughter in-law	1	0.5
	Spouse	22	10.9
Type of house	Detached house, bungalow, traditional house	36	17.9
	Flat, apartment, condominium	47	23.4
	Semi-Detached	18	9.0
	Shop house	6	3.0
	Squatters	2	1.0
	Town house, terrace, link house, cluster	92	45.8
Ownership status of the house	Government/employer-provided staff quarters	6	3.0
	Living for free in a house owned by non-household members	7	3.5
	Owned	144	71.6

	Rented	44	21.9
Household size	1	2	1.0
	2	16	8.0
	3	32	15.9
	4	52	25.9
	5	50	24.9
	6	25	12.4
	7	14	7.0
	8	6	3.0
	9	4	2.0
Dog(s) as pets	No	146	72.6
	Yes, 1 dog	41	20.4
	Yes, 2 dogs	8	4.0
	Yes, 3 dogs	2	1.0
	Yes, more than 3 dogs	4	2.0

4.3 Knowledge scores of the respondents regarding canine rabies

The overall knowledge scores on canine rabies is represented in Table 4.4. More than half of the respondents (65.7%, n = 132) had high knowledge regarding canine rabies, while moderate knowledge 25.4% (n = 51) and low knowledge 9.0% (n = 18) among the respondents. Table 4.4 shows the sociodemographic factors that were associated significantly with the respondents' knowledge scores, which include age, working or studying in Veterinary Medicine or Medical field, and type of house ($p<0.05$). It is found that the majority of those who acquired high knowledge and low knowledge are those between the age of 18 and 25 (59.1%, n = 78). Besides that, those with Veterinary or Medical backgrounds showed high knowledge (62.9%, n = 49) than those without said background (32.1%, n = 49).

Table 4.3: Frequency of knowledge and attitude among Klang Valley community (n = 201)

Level of Knowledge	Frequency	Percent (%)
High	132	65.7
Moderate	51	25.4
Low	18	9.0
Classification of Attitude		
Negative	4	2.0
Neutral	46	22.9
Positive	151	75.1

Table 4.4: Association between sociodemographic factors and knowledge score regarding canine rabies (n = 201)

Sociodemographic characteristics	High		Low		Moderate		p-value
District	F	%	F	%	F	%	
Gombak	8	6.1%	1	5.6%	6	11.8%	
Hulu Langat	24	18.2%	3	16.7%	8	15.7%	
Klang	12	9.1%	2	11.1%	4	7.8%	
Kuala Langat	7	5.3%	0	0.0%	3	5.9%	0.882
Kuala Lumpur	19	14.4%	2	11.1%	10	19.6%	
Petaling Jaya	46	34.8%	8	44.4%	17	33.3%	
Sepang	16	12.1%	2	11.1%	3	5.9%	
Gender							
Female	85	64.4%	14	77.8%	39	76.5%	0.196
Male	47	35.6%	4	22.2%	12	23.5%	
Age							
18 -25	78	59.1%	11	61.1%	30	58.8%	
26 - 33	28	21.2%	0	0.0%	7	13.7%	**0.033***
34 - 41	13	9.8%	1	5.6%	4	7.8%	
42 - 49	8	6.1%	3	16.7%	3	5.9%	

50 or older	5	3.8%	3	16.7%	7	13.7%	[Cramér's V value = 0.192]
Ethnicity							
Chinese	41	31.1%	6	33.3%	16	31.4%	
Indian	14	10.6%	3	16.7%	7	13.7%	0.932
Malay	73	55.3%	9	50.0%	27	52.9%	
Others	4	3.0%	0	0.0%	1	2.0%	
Citizenship							
Malaysian	128	97.0%	17	94.4%	51	100.0%	
Non-Malaysian Citizen	2	1.5%	0	0.0%	0	0.0%	0.352
Permanent resident of Malaysia	2	1.5%	1	5.6%	0	0.0%	
Marital Status							
Divorced	2	1.5%	1	5.6%	0	0.0%	
Living with partner	2	1.5%	0	0.0%	2	3.9%	
Married	40	30.3%	6	33.3%	14	27.5%	0.717
Never married	87	65.9%	11	61.1%	34	66.7%	
Widow/ Widower	1	0.8%	0	0.0%	1	2.0%	
Working							
No	64	48.5%	11	61.1%	29	56.9%	0.421
Yes	68	51.5%	7	38.9%	22	43.1%	
Occupation							
Government employee	8	6.1%	1	5.6%	3	5.9%	
Private employee	35	26.5%	4	22.2%	15	29.4%	
Self-employed	17	12.9%	2	11.1%	3	5.9%	
Semi-government employee	8	6.1%	1	5.6%	2	3.9%	0.821
Student	61	46.2%	9	50.0%	24	47.1%	
Unpaid family worker	1	0.8%	1	5.6%	3	5.9%	
Unpaid worker	2	1.5%	0	0.0%	1	2.0%	

Working or studying in Veterinary Medicine or Medical field							
No	83	62.9%	18	12.3%	45	30.8%	**<0.001**
Yes	49	37.1%	0	0.0%	6	10.9%	[Phi value = 0.310]
Relationship to head of household							
Brother- or Sister-in-law	0	0.0%	0	0.0%	1	2.0%	
Child	63	47.7%	8	44.4%	22	43.1%	
Friend	4	3.0%	0	0.0%	1	2.0%	
Grand- or great-grandchild	1	0.8%	1	5.6%	0	0.0%	
Grand- or great-grandparent	5	3.8%	0	0.0%	1	2.0%	
Head of Household	15	11.4%	2	11.1%	8	15.7%	0.636
Other relatives	1	0.8%	0	0.0%	0	0.0%	
Parent	15	11.4%	4	22.2%	8	15.7%	
Parent-in-law	1	0.8%	0	0.0%	0	0.0%	
Siblings	3	2.3%	0	0.0%	4	7.8%	
Son- or Daughter in-law	0	0.0%	0	0.0%	1	2.0%	
Spouse	16	12.1%	2	11.1%	4	7.8%	
Others	8	6.1%	1	5.6%	1	1.9%	
Type of House							
Detached house, bungalow, traditional house	19	14.4%	7	38.9%	10	19.6%	
Flat, apartment, condominium	36	27.3%	3	16.7%	8	15.7%	**0.038***
Semi-Detached	12	9.1%	2	11.1%	4	7.8%	
Shop house	5	3.8%	1	5.6%	0	0.0%	

Squatters	0	0.0%	1	5.6%	1	2.0%	[Cramér's V value = 0.217]
Town house, terrace, link house, cluster	60	45.5%	4	22.2%	28	54.9%	
Ownership of the house							
Government/employer-provided staff quarters	5	3.8%	0	0.0%	1	2.0%	
Living for free in a house owned by non-household members	5	3.8%	2	11.1%	0	0.0%	0.186
Owned	90	68.2%	13	72.2%	41	80.4%	
Rented	32	24.2%	3	16.7%	9	17.6%	
Household Size							
1	1	0.8%	0	0.0%	1	2.0%	
2	11	8.3%	1	5.6%	4	7.8%	
3	22	16.7%	0	0.0%	10	19.6%	
4	32	24.2%	8	44.4%	12	23.5%	
5	33	25.0%	7	38.9%	10	19.6%	0.140
6	14	10.6%	1	5.6%	10	19.6%	
7	11	8.3%	1	5.6%	2	3.9%	
8	6	4.5%	0	0.0%	0	0.0%	
9	2	1.5%	0	0.0%	2	3.9%	
Dog(s) as pets							
No	97	73.5%	11	61.1%	38	74.5%	
Yes, 1 dog	26	19.7%	5	27.8%	10	19.6%	
Yes, 2 dogs	5	3.8%	1	5.6%	2	3.9%	0.795
Yes, 3 dogs	1	0.8%	1	5.6%	0	0.0%	
Yes, more than 3 dogs	3	2.3%	0	0.0%	1	2.0%	

Note: (*****) – significant at $p < 0.05$

Table 4.5: Pearson Chi-Square Residual Analysis based on Table 4.4

Sociodemographic characteristics	**High Knowledge**			**Low Knowledge**			**Moderate Knowledge**		
	O	*E*	*AR*	*O*	*E*	*AR*	*O*	*E*	*AR*
Age									
18 -25	78	78.1	0	11	10.7	0.2	30	30.2	-0.1
26 - 33	28	23	**2***	0	3.1	-2	7	8.9	-0.8
34 - 41	13	11.8	0.6	1	1.6	-0.5	4	4.6	-0.3
42 - 49	8	9.2	-0.7	3	1.3	1.7	3	3.6	-0.4
50 or older	5	9.9	-2.7	3	1.3	1.6	7	3.8	**2***
Type of House									
Detached house, bungalow, traditional house	19	23.6	-1.8	7	3.2	**2.4***	10	9.1	0.4
Flat, apartment, condominium	36	30.9	1.8	3	4.2	-0.7	8	11.9	-1.5
Semi-Detached	12	11.8	0.1	2	1.6	0.3	4	4.6	-0.3
Shop house	5	3.9	0.9	1	0.5	0.7	0	1.5	-1.5
Squatters	0	1.3	-2	1	0.2	**2***	1	0.5	0.8
Town house, terrace, link house, cluster	60	60.4	-0.1	4	8.2	-2.1	28	23.3	1.5

O: Observed value, E: Expected Value, AR: Adjusted Residual

Note: (*****) – significant at AR > 1.96

4.4 Attitude classification of respondents regarding canine rabies

The overall attitude classification on canine rabies is represented in Table 4.4. The attitude section encompasses the respondents' risk factors of contracting rabies. Approximately three-quarters of the respondents (75.1%, n = 151) had a positive attitude, 22.9% had a neutral attitude (n = 46), and only a minority of them had a

negative attitude (2.0%, n = 4). Chi-squared test was done (Table 4.6), two sociodemographic factors which are ethnicity and having dog(s) as pets are significantly associated with the attitude scores ($p<0.05$). The majority of those with a positive attitude are comprised of Malay respondents (64.9%, n = 98) while most of those with a negative attitude are Chinese respondents (63.0%, n = 29). On top of that, 80.8% (n = 122) of those who acquired positive attitude are non-dog owners while only a sum of 29% (n = 29) of them were dog owners with a positive attitude.

Table 4.6: Association between sociodemographic factors and respondent's attitude regarding risk factors of contracting dog related diseases (n = 201)

Sociodemographic characteristics	**Negative Attitude**		**Neutral Attitude**		**Positive Attitude**		**p-value**
District	F	%	F	%	F	%	
Gombak	1	25.0%	7	15.2%	7	4.6%	
Hulu Langat	0	0.0%	6	13.0%	29	19.2%	
Klang	1	25.0%	2	4.3%	15	9.9%	
Kuala Langat	0	0.0%	0	0.0%	10	6.6%	0.052
Kuala Lumpur	1	25.0%	11	23.9%	19	12.6%	
Petaling Jaya	1	25.0%	17	37.0%	53	35.1%	
Sepang	0	0.0%	3	6.5%	18	11.9%	
Gender							
Female	4	100.0%	29	63.0%	105	69.5%	0.156
Male	0	0.0%	17	37.0%	46	30.5%	
Age							
18 -25	2	50.0%	28	60.9%	89	58.9%	
26 - 33	1	25.0%	7	15.2%	27	17.9%	
34 - 41	1	25.0%	5	10.9%	12	7.9%	0.566
42 - 49	0	0.0%	5	10.9%	9	6.0%	
50 or older	0	0.0%	1	2.2%	14	9.3%	
Ethnicity							
Chinese	0	0.0%	29	63.0%	34	22.5%	**<0.001***

Indian	2	50.0%	7	15.2%	15	9.9%	[Cramér's
Malay	2	50.0%	9	19.6%	98	64.9%	V value =
Others	0	0.0%	1	2.2%	4	2.6%	0.312]
Citizenship							
Malaysian	4	100.0%	45	97.8%	147	97.4%	
Non-Malaysian Citizen	0	0.0%	0	0.0%	2	1.3%	0.840
Permanent resident of Malaysia	0	0.0%	1	2.2%	2	1.3%	
Marital Status							
Divorced	0	0.0%	1	2.2%	2	1.3%	
Living with partner	0	0.0%	2	4.3%	2	1.3%	
Married	1	25.0%	12	26.1%	47	31.1%	0.245
Never married	2	50.0%	30	65.2%	100	66.2%	
Widow/ Widower	1	25.0%	1	2.2%	0		
Working							
No	2	50.0%	18	39.1%	84	55.6%	0.145
Yes	2	50.0%	28	60.9%	67	44.4%	
Occupation							
Government employee	1	25.0%	1	2.2%	10	6.6%	
Private employee	1	25.0%	16	34.8%	37	24.5%	
Self-employed	0	0.0%	4	8.7%	18	11.9%	
Semi-government employee	0	0.0%	4	8.7%	7	4.6%	0.630
Student	2	50.0%	19	41.3%	73	48.3%	
Unpaid family worker	0	0.0%	2	4.3%	3	2.0%	
Unpaid worker	0	0.0%	0	0.0%	3	2.0%	
Working or studying in Veterinary Medicine or Medical field							
No	2	1.4%	39	26.7%	105	71.9%	0.065

Yes	2	3.6%	7	12.7%	46	83.6%	
Relationship to head of household							
Brother- or Sister-in-law	0	0.0%	0	0.0%	1	0.7%	
Child	3	75.0%	16	34.8%	74	49.0%	
Friend	0	0.0%	1	2.2%	4	2.6%	
Grand- or great-grandchild	0	0.0%	1	2.2%	1	0.7%	
Grand- or great-grandparent	0	0.0%	1	2.2%	5	3.3%	
Head of Household	0	0.0%	8	17.4%	17	11.3%	0.765
Other relatives	0	0.0%	0		1	0.7%	
Parent	0	0.0%	6	13.0%	21	13.9%	
Parent-in-law	0	0.0%	1	2.2%	0	0.0%	
Siblings	0	0.0%	4	8.7%	3	2.0%	
Son- or Daughter in-law	0	0.0%	1	2.2%	0	0.0%	
Spouse	1	25.0%	5	10.9%	16	10.6%	
Others	0	0.0%	2	4.3%	8	5.3%	
Type of House							
Detached house, bungalow, traditional house	0	0.0%	8	17.4%	28	18.5%	
Flat, apartment, condominium	0	0.0%	16	34.8%	31	20.5%	
Semi-Detached	0	0.0%	6	13.0%	12	7.9%	
Shop house	0	0.0%	2	4.3%	4	2.6%	0.060
Squatters	1	25.0%	0	0.0%	1	0.7%	
Town house, terrace, link house, cluster	3	75.0%	14	30.4%	75	49.7%	

Ownership of the house							
Government/employer-provided staff quarters	0	0.0%	2	4.3%	4	2.6%	
Living for free in a house owned by non-household members	0	0.0%	1	2.2%	6	4.0%	0.714
Owned	3	75.0%	29	63.0%	112	74.2%	
Rented	1	25.0%	14	30.4%	29	19.2%	
Household Size							
1	0	0.0%	2	4.3%	0	0.0%	
2	1	25.0%	6	13.0%	9	6.0%	
3	0	0.0%	12	26.1%	20	13.2%	
4	1	25.0%	9	19.6%	42	27.8%	
5	1	25.0%	12	26.1%	37	24.5%	0.061
6	1	25.0%	1	2.2%	23	15.2%	
7	0	0.0%	1	2.2%	13	8.6%	
8	0	0.0%	2	4.3%	4	2.6%	
9	0	0.0%	1	2.2%	3	2.0%	
Dog(s) as pets							
No	3	75.0%	21	45.7%	122	80.8%	
Yes, 1 dog	1	25.0%	17	37.0%	23	15.2%	**0.002***
Yes, 2 dogs	0	0.0%	4	8.7%	4	2.6%	[Cramér's
Yes, 3 dogs	0	0.0%	2	4.3%	0	0.0%	V value =
Yes, more than 3 dogs	0	0.0%	2	4.3%	2	1.3%	0.255]

Note: (*****) – significant at $p < 0.05$

Table 4.7: Pearson Chi-Square Residual Analysis based on Table 4.6

Sociodemographic characteristics	Negative Attitude			Neutral Attitude			Positive Attitude		
	O	*E*	*AR*	*O*	*E*	*AR*	*O*	*E*	*AR*
Age									
Chinese	0	1.3	-1.4	29	14.4	**5.3***	34	47.3	-4.7
Indian	2	0.5	**2.4***	7	5.5	0.8	15	18	-1.5
Malay	2	2.2	-0.2	9	24.9	-5.4	98	81.9	**5.3***
Others	0	0.1	-0.3	1	1.1	-0.2	4	3.8	0.3
Dog(s) as pets									
No	3	2.9	0.1	21	33.4	-4.7	122	109.7	**4.5***
Yes, 1 dog	1	0.8	0.2	17	9.4	**3.2***	23	30.8	-3.2
Yes, 2 dogs	0	0.2	-0.4	4	1.8	1.9	4	6	-1.7
Yes, 3 dogs	0	0	-0.2	2	0.5	**2.6***	0	1.5	-2.5
Yes, more than 3 dogs	0	0.1	-0.3	2	0.9	1.3	2	3	-1.2

O: Observed value, E: Expected Value, AR: Adjusted Residual
Note: (*****) – significant at AR > 1.96

4.5 Health seeking behavior of respondents after being bitten or scratched by dogs

In this study, the health seeking behavior after dog bite or scratches were assessed and most of them scored "bad behavior' (88.2%, n = 30) while only 11.8% (n = 4) scored "good behavior" (Table 4.8). For those respondents with no history of dog bites or scratches, more than half of them attained "bad behavior", and only 35.3% (n = 59) attained "good behavior" if they were to be bitten or scratched by a dog (Table 4.9).

Table 4.10 represents the sociodemographic factors of respondents with a history of a dog bite or scratch that were associated significantly with the respondents' health seeking behavior scores. It was found that ethnicity and having a veterinary or medical

backgrounds showed statistically significant association ($p<0.05$). On the other hand, Table 4.11 showed the sociodemographic factors of respondents with no history of a dog bite or scratch association with the behavior scores. Two factors that were significantly associated are having veterinary or medical backgrounds and having dog(s) as pets.

Table 4.8: Frequency of respondents with dog bite history (n = 34)

Behaviour	Frequency	Percent (%)
Bad	30	88.2
Good	4	11.8

Table 4.9: Frequency of respondents with no history of dog bite (n = 167)

Behaviour	Frequency	Percent (%)
Bad	108	64.7
Good	59	35.3

Table 4.10: Association between good health seeking behavior after being bitten or scratched by dogs within the past one year and sociodemographic characteristics of respondent (n = 34)

Sociodemographic characteristics	Bad Practice		Good Practice		p-value
District	**F**	**(%)**	**F**	**(%)**	
Gombak	4	13.3%	1	25.0%	
Klang	6	20.0%	1	25.0%	
Kuala Lumpur	7	23.3%	2	50.0%	0.361
Petaling Jaya	9	30.0%	0	0.0%	
Sepang	4	13.3%	0	0.0%	
Gender					
Female	16	53.3%	3	75.0%	0.777
Male	14	46.7%	1	25.0%	
Age					
18 -25	19	63.3%	3	75.0%	
26 - 33	3	10.0%	0	0.0%	

34 - 41	5	16.7%	0	0.0%	0.511
42 - 49	1	3.3%	0	0.0%	
50 or older	2	6.7%	1	25.0%	
Ethnicity					
Chinese	16	53.3%	0	0.0%	**0.011***
Indian	7	23.3%	0	0.0%	[Cramér's V
Malay	6	20.0%	4	100.0%	value =
Others	1	3.3%	0	0.0%	0.566]
Citizenship					
Malaysian	30	100.0%	4	100.0%	
Marital Status					
Divorced	0	0.0%	1	25.0%	
Living with partner	2	6.7%	0	0.0%	
Married	9	30.0%	0	0.0%	0.069
Never married	19	63.3%	3	75.0%	
Working					
No	13	43.3%	3	75.0%	0.323
Yes	17	56.7%	1	25.0%	
Occupation					
Government employee	2	6.7%	0	0.0%	
Private employee	8	26.7%	1	25.0%	
Self-employed	4	13.3%	0	0.0%	
Semi-government employee	1	3.3%	0	0.0%	0.714
Student	13	43.3%	3	75.0%	
Unpaid family worker	2	6.7%	0	0.0%	
Working or studying in Veterinary Medicine or Medical field					
No	20	66.7%	0	0.0%	**0.005***
Yes	10	33.3%	4	100.0%	

					[Phi value = 0.436]
Relationship to head of household					
Child	10	33.3%	2	50.0%	
Grand- or great-grandchild	1	3.3%	0	0.0%	
Grand- or great-grandparent	3	10.0%	0	0.0%	
Head of Household	5	16.7%	1	25.0%	0.790
Parent	4	13.3%	0	0.0%	
Siblings	3	10.0%	1	25.0%	
Spouse	2	6.7%	0	0.0%	
Others	2	6.7%	0	0.0%	
Type of House					
Detached house, bungalow, traditional house	8	26.7%	0	0.0%	
Flat, apartment, condominium	5	16.7%	0	0.0%	
Semi-Detached	6	20.0%	1	25.0%	0.306
Shop house	1	3.3%	0	0.0%	
Squatters	2	6.7%	0	0.0%	
Town house, terrace, link house, cluster	8	26.7%	3	75.0%	
Ownership of the house					
Owned	22	73.3%	4	100.0%	0.551
Rented	8	26.7%	0	0.0%	
Household Size					
2	0	0.0%	1	25.0%	
3	6	20.0%	1	25.0%	

4	8	26.7%	0	0.0%	
5	7	23.3%	2	50.0%	0.228
6	4	13.3%	0	0.0%	
7	2	6.7%	0	0.0%	
8	1	3.3%	0	0.0%	
9	2	6.7%	0	0.0%	
Dog(s) as pets					
No	10	33.3%	4	100.0%	
Yes, 1 dog	13	43.3%	0	0.0%	
Yes, 2 dogs	4	13.3%	0	0.0%	0.096
Yes, 3 dogs	2	6.7%	0	0.0%	
Yes, more than 3 dogs	1	3.3%	0	0.0%	

Note: (*****) – significant at p< 0.05

Table 4.11: Association between good health seeking behavior among those who have never been bitten or scratched by dogs and sociodemographic characteristics of respondents (n = 167)

Sociodemographic characteristics	**Bad Practice**		**Good Practice**		**p-value**
District	**F**	**(%)**	**F**	**(%)**	
Gombak	8	7.4%	2	3.4%	
Hulu Langat	17	15.7%	18	30.5%	
Klang	10	9.3%	1	1.7%	
Kuala Langat	6	5.6%	4	6.8%	0.094
Kuala Lumpur	17	15.7%	5	8.5%	
Petaling Jaya	39	36.1%	23	39.0%	
Sepang	11	10.2%	6	3.4%	
Gender					
Female	74	68.5%	45	76.3%	0.371
Male	34	31.5%	14	23.7%	
Age					

18 -25	56	51.9%	41	69.5%	
26 - 33	21	19.4%	11	18.6%	
34 - 41	11	10.2%	2	3.4%	
42 - 49	10	9.3%	3	5.1%	0.108
50 or older	10	9.3%	2	3.4%	
Ethnicity					
Chinese	32	29.6%	15	25.4%	
Indian	15	13.9%	2	3.4%	
Malay	58	53.7%	41	69.5%	
Others	3	2.8%	1	1.7%	
Citizenship					
Malaysian	105	97.2%	57	96.6%	
Non-Malaysian					0.911
Citizen	1	0.9%	1	1.7%	
Permanent resident of Malaysia	2	1.9%	1	1.7%	
Marital Status					
Divorced	2	1.9%	0	0.0%	
Living with partner	1	0.9%	1	1.7%	
Married	39	36.1%	12	20.3%	
Never married	64	59.3%	46	78.0%	0.062
Widow/ Widower	2	1.9%	0	0.0%	
Working					
No	52	1.7%	36	61.0%	0.144
Yes	56	20.3%	23	39.0%	
Occupation					
Government employee	8	7.4%	2	3.4%	
Private employee	31	28.7%	14	23.7%	
Self-employed	13	12.0%	5	8.5%	

Semi-government employee	8	7.4%	2	3.4%	0.164
Student	44	40.7%	34	57.6%	
Unpaid family worker	3	2.8%	0	0.0%	
Unpaid worker	1	0.9%	2	3.4%	
Working or studying in Veterinary Medicine or Medical field					
No	94	87.0%	32	54.0%	**<0.001***
Yes	14	13.0%	27	45.8%	[Phi value = 0.364]
Relationship to head of household					
Brother- or Sister-in-law	1	0.9%	0	0.0%	
Child	43	39.8%	38	64.4%	
Friend	1	0.9%	4	6.8%	
Grand- or great-grandchild	1	0.9%	0	0.0%	
Grand- or great-grandparent	3	2.8%	0	0.0%	**0.006***
Head of Household	15	13.9%	4	6.8%	[Cramér's V value = 0.378]
Other relatives	1	0.9%	0	0.0%	
Parent	21	4.6%	3	5.1%	
Parent-in-law	1	19.4%	2	3.4%	
Siblings	1	0.9%	0	0.0%	
Son- or Daughter in-law	1	0.9%	2	3.4%	
Spouse	14	0.9%	0	0.0%	
Others	21	13.0%	6	10.2%	
Type of House					

Detached house, bungalow, traditional house	22	20.4%	6	10.2%	
Flat, apartment, condominium	28	25.9%	14	23.7%	
Semi-Detached	6	5.6%	5	8.5%	0.438
Shop house	3	2.8%	2	3.4%	
Town house, terrace, link house, cluster	49	45.4%	32	54.2%	
Ownership of the house					
Government/employer-provided staff quarters	5	4.6%	1	1.7%	
Living for free in a house owned by non-household members	5	4.6%	2	3.4%	
Owned	79	73.1%	39	66.1%	0.309
Rented	19	17.6%	17	28.8%	
Household Size					
1	2	1.9%	0	0.0%	
2	9	8.3%	6	10.2%	
3	20	18.5%	5	8.5%	
4	25	23.1%	19	32.2%	
5	26	24.1%	15	25.4%	0.139
6	15	13.9%	6	10.2%	
7	8	7.4%	4	6.8%	
8	1	0.9%	4	6.8%	
9	2	1.9%	0	0.0%	
Dog(s) as pets					

No	82	75.9%	50	84.7%	
Yes, 1 dog	24	22.2%	4	6.8%	**0.004***
Yes, 2 dogs	2	1.9%	2	3.4%	[Phi value
Yes, more than 3					= 0.264]
dogs	0	0.0%	3	5.1%	

Note: (*****) – significant at p< 0.05

Table 4.12: Pearson Chi-Square Residual Analysis based on Table 4.10

Sociodemographic characteristics	**Bad health seeking behavior**			**Good health seeking behavior**		
	O	*E*	*AR*	*O*	*E*	*AR*
Age						
Chinese	16	14.1	**2***	0	1.9	-2
Indian	7	6.2	1.1	0	0.8	-1.1
Malay	6	8.8	-3.3	4	1.2	**3.3***
Other	1	0.9	0.4	0	0.1	-0.4
Working or studying in Veterinary Medicine or Medical field						
No	20	17.6	**2.5***	0	2.4	-2.5
Yes	10	12.4	-2.5	4	1.6	**2.5***

O: Observed value, E: Expected Value, AR: Adjusted Residual
Note: (*****) – significant at AR > 1.96

Table 4.13: Pearson Chi-Square Residual Analysis based on Table 4.11

Sociodemographic characteristics	**Bad health seeking behavior**			**Good health seeking behavior**		
	O	*E*	*AR*	*O*	*E*	*AR*
Working or studying in Veterinary Medicine or Medical field						
No	94	81.5	**4.7***	32	44.5	4.7
Yes	14	26.5	-4.7	27	14.5	**4.7***
Relationship to head of household						
Brother- or Sister-in-law	1	0.6	0.7	0	0.4	0.7

Child	43	52.4	-3	38	28.6	**3***
Friend	1	3.2	-2.1	4	1.8	2.1
Grand- or great-grandchild	1	0.6	0.7	0	0.4	-0.7
Grand- or great-grandparent	3	1.9	1.3	0	1.1	-1.3
Head of Household	15	12.3	1.4	4	6.7	-1.4
Other relatives	1	0.6	0.7	0	0.4	-0.7
Others	5	5.2	-0.1	3	2.8	0.1
Parent	21	14.9	**2.9***	2	8.1	-2.9
Parent-in-law	1	0.6	0.7	0	0.4	-0.7
Siblings	1	1.9	-1.1	2	1.1	1.1
Son- or Daughter in-law	1	0.6	0.7	0	0.4	-0.7
Spouse	14	12.9	0.5	6	7.1	-0.5
Dog(s) as pets						
No	82	85.4	-1.3	50	46.6	1.3
Yes, 1 dog	24	18.1	**2.6***	4	9.9	-2.6
Yes, 2 dogs	2	2.6	-0.6	2	1.4	0.6
Yes, more than 3 dogs	0	1.9	-2.4	3	1.1	**2.4***

O: Observed value, E: Expected Value, AR: Adjusted Residual
Note: (*****) – significant at AR > 1.96

4.6 Risk Factors associated with Canine Rabies among Household with pet Dog(s)

The data on characteristics of household dogs are represented in Table 4.14. The total respondents who owned dog(s) are 55 with more than half of them owning only one dog (74.5%, n = 41), 14.5% (n = 8) with two dogs, 3.6% (n = 2) with three dogs, and only 7.3% (n = 4) owned more than three dogs. Majority of the households (76.4%, n = 42) would never allow their dogs to roam freely without any supervision. It is recorded that approximately three-quarters of the household dogs (76.4%, n = 42) are vaccinated against rabies and only 13% (23.6%, n = 13) of them did not vaccinate their dogs against rabies with most of them chose “I don’t feel the need to” as a reasoning.

The owned dog population survey showed that 72.7% (n = 40) of them had neutered their dogs and majority of them (85.5%, n = 47) would bring their sick dogs to the veterinary clinic.

Table 4.14: Characteristic of Household Dog(s) (n = 55)

		n	%
Number of dogs owned per household	Yes, 1 dog	41	74.5
	Yes, 2 dogs	8	14.5
	Yes, 3 dogs	2	3.6
	Yes, more than 3 dogs	4	7.3
Do you allow your dog(s) to roam freely outside without any supervision?	Never	42	76.4
	Sometimes	11	20.0
	Always	2	3.6
Do you vaccinate your dog(s) against rabies?	Yes	42	76.4
	No	13	23.6
Reason for not getting their dogs vaccinated against rabies (n =13)	Vaccines are expensive	2	-
	Vaccines not available	2	-
	I have no idea that dogs are vaccinated against rabies	3	-
	I don't feel the need to	6	-
Dog(s) are spayed or castrated	Yes	40	72.7
	No	15	27.3
How do you treat your dog(s) when they are sick?	Taken to the veterinary clinic	47	85.5
	Given medication at home by myself	6	10.9
	Treat with traditional herbals	1	1.8
	Leave the dogs on their own	1	1.8

Table 4.15: Correlation Between Knowledge, Attitude and Behavior After Being Bitten or Scratched by a Dog

Variables	**Knowledge**	**Attitude**	**Behavior**
Knowledge	-	0.166* (<0.032)	0.433** (<0.001)

**. Correlation is significant at the 0.05 level (2 tailed).*

***. Correlation is significant at the 0.01 level (2 tailed).*

CHAPTER 5

DISCUSSION

The knowledge level among respondents were at a satisfactory level with 65.7% (n = 132) and 25.4% (n = 51) displayed a high and moderate level of knowledge, respectively. All respondents demonstrated adequate understanding of the rabies transmission, clinical signs seen in dogs, and its vaccination-based prevention and treatment. Based on this study, it was found that three sociodemographic characteristics namely, age, having medical or veterinary backgrounds and type of house were associated with the level of knowledge of the respondent regarding canine rabies. Based on the Chi-Square adjusted residuals (Table 4.5), the results showed that those aged 50 or older who acquired moderate level of knowledge and those aged between 26 and 23 with high and low level of knowledge contributed to the chi-square association test. This is consistent with a previous report from Indonesia where younger people had a better knowledge regarding rabies compared to adults which can be due to the higher level of education this age group obtained (Christopher et al., 2021). Bouaddi et al. (2020) also reported that the level of KAP regarding rabies among adults were lower than young people while those with higher education level had higher KAP level, and it was found that age is highly associated with the level of education. Besides that, respondents with veterinary and medical backgrounds showed high knowledge and those without exhibited low knowledge which contributed to the significance. This can be explained by those who worked or studied in Veterinary Medicine or Medical fields have acquired at least the basic knowledge regarding rabies. Besides that, those that live in detached houses, bungalows or traditional houses had poor knowledge regarding rabies also contributed to the significance based on the adjusted residual test.

In terms of attitude, many of the respondents in this study had a positive attitude (75.1%, n = 151) while 22.9% (n = 46) and 2.0% (n = 4) had neutral attitude and negative attitude, respectively. The attitude section determines the risk of exposure to rabies. Therefore, a respondent who scored positive attitude will have a lesser risk in

contracting rabies compared to those with neutral and negative attitude. Only two sociodemographic variables were significantly associated with the attitude against rabies ($p<0.05$) which were ethnicity and household dog owning status. From the adjusted residual test, it can be seen that Chinese respondents, and owning 2 to 3 dogs with neutral attitude contributed to the significance in the chi-square test results, as well as Malay respondents and not owning any dogs with positive attitude. This can be supported by a study conducted by Li et al. (2021) which reported that rabies is best prevented by avoiding animal bites or scratches which was not the case for individuals who loves cats or dogs.

As for health seeking behavior of respondents with a history of dog bite or scratches, most of them scored bad behavior (88.2%, n = 30) while only a minority of them scored good behavior (11.8%, n = 4). Two sociodemographic factors that were significantly associated were ethnicity and having a veterinary or medical backgrounds. Based on the adjusted residual test, Chinese with bad behavior and Malay respondents with good behavior contributed to the significance which also showed the same pattern as in Attitude section. Next, health seeking behavior with no history of dog bites or scratches were also recorded if they were to be bitten or scratched. Our study revealed that only 35.3% (n = 59) of them scored good and 64.7% (n = 108) scored bad. Owning dog(s) as pets, experience in the veterinary or medical fields, and relationship to the head of the household showed significant association. Based on the adjusted residual test, having more than 3 dogs with good behavior and those with one dog bad behavior contributed to the significance. A similar study was done in Ethiopia where the mean knowledge scored showed significant difference based on the number of dogs owned as those owned more than one dog scored higher than those who owned one or no dogs at all (Bihon et al., 2020). Thus, correlation analysis was done between knowledge and behavior in this study showed significant results which further validated the findings in this study (Table 4.15). Next, respondents who were parents and child to the head of household showed bad behavior and good behaviour, respectively, contributed to the significance seen in the association test. No reports can be found that showed similar findings. However, a study on association between household relationships and healthcare seeking behavior

in Eastern Africa conducted by Akinyemi et al. (2019) showed contraindicated findings to this study. It stated that those who are daughter or daughter-in-law to the head of household will show lower chance of seeking healthcare for childhood diarrhea, as they will turn to their parents or parent-in-law when making healthcare decisions for their children leading them to turn to traditional healers which they preferred. In both respondents with or without dog bite or scratch history showed that those with veterinary or medicine backgrounds had good health seeking behavior and those without veterinary and medical backgrounds showed bad health seeking behavior contributed to the significance based on the adjusted residual test done.

Table 4.14 which represents characteristics of households with dogs, showed that 23.6% (n = 14) of dog owners sometimes or always allowed their dog(s) to roam freely outside without supervision, which is concerning. According to Warembourg et al. (2021), dogs that are owned by a person or a community and allowed to roam outside freely all or part of the time are defined as free-roaming domestic dogs (FRDD). FRDD are known to be the primary vectors for the spread of rabies globally. In addition, almost a quarter of respondents who are dog owners stated that they did not vaccinate their dogs against rabies. The latest data on dog's rabies vaccination status in a country is vital as World Health Organization (WHO) stated that in order to eliminate or prevent rabies outbreaks from occurring in the future, 70% of dogs in a population should be immunized (Coleman & Dye, 2021). Equally important, the majority of the respondents had their dog(s) spayed or castrated (72.7%, n = 40) which is a good practice for rabies prevention given that neutering helps in reducing population turnover which consequently aids in increasing rabies vaccination coverage (Collinson *et al.*, 2020). On top of that, Reece et al. (2013) concluded that spaying female dogs help in reducing the maternal protective behavior which can reduce dog bite injuries. Lastly, most of the respondents preferred to bring their dog(s) to certified vets if they are sick (85.5%, n = 47). This is crucial, especially in detecting clinical signs of rabies in dogs which may be potentially life-saving to the dog owners.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATION

To achieve the goal of eradicating rabies worldwide by 2030, it is crucial to have good rabies knowledge, attitudes, and practices. Overall, this study showed knowledge and attitude regarding canine rabies were generally high. However, it was identified that Klang Valley community showed unsatisfactory health seeking behavior after bitten or scratched by a dog. Therefore, knowledge gaps regarding rabies and its lethality exists, as seen by the lack of proper post-exposure prophylaxis (PEP). Hence, focus should be in implementing intervention programs to enhance public understanding of rabies prevention and control as well as to improve on behaviors of rabies PEP.

The study instrument involved a self-administered, close-ended online questionnaire. Hence, sampling bias may have occurred due to only those who were literate and had access to the Internet participated in the survey. Respondent bias was also of a concern as the respondents were only limited to a set of answers provided. Apart from that, this study could not establish precisely to which the population they are distributed as there were not enough representatives from each district in Klang Valley to participate in the survey.

Thus, recommendations for future research are as follows;

1. Pen-and-Paper Personal Interview (PAPI) should be incorporated to include respondents of different backgrounds and area.
2. Larger sample size by collecting more respondents from each district of Klang Valley and adopt stratified sampling technique.

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APPENDIX

QUESTIONNAIRE ON HOUSEHOLD SOCIODEMOGRAPHICS, OWNED DOG DEMOGRAPHICS AND WELFARE, KNOWLEDGE OF RABIES IN MALAYSIA

KRITERIA KELAYAKAN: AHLI ISI RUMAH BERUMUR 18 TAHUN DAN KE ATAS

ELIGIBILITY CRITERIA: HOUSEHOLD MEMBERS AGED 18 YEARS AND ABOVE

Consent to participate: Yes _____

CTION A: SOCIODEMOGRAPHY, HOME AND ENVIRONMENT		
Sila jawab **SEMUA** soalan dan tandakan (√) pada yang berkenaan *Answer **ALL** question and tick (√) your relevant answers*		
A0001	Nama responden: *Respondent's name:*	
A0002	Daerah: *District:*	*a.* Kuala Lumpur (Cheras, Ampang jaya, etc.) *b.* Gombak (Rawang, Selayang, kuang, etc.) *c.* Hulu Langat (Kajang, Bandar Baru Bangi, Semenyih etc.) *d.* Kuala Langat *e.* Petaling Jaya (Serdang, Seri Kembangan, Puchong, Subang Jaya, Petaling etc.) *f.* Klang (Bukit raja, Kapar, Pandamaran, etc) *g.* Sepang (Cyberjaya, Putrajaya)
A0003	Jantina *Gender*	*a.* Lelaki *Male* *b.* Female *Female*

A0004	Apakah hubungan anda dengan ketua isi rumah? *What is your relationship to the head of household?* Pilih **SATU** jawapan sahaja. *Choose **ONE** answer only.*	*a.* Ketua isi rumah *Head of Household* *b.* Suami atau isteri *Spouse* *c.* Ibu bapa *Parent* *d.* Anak *Child* *e.* Datuk/nenek atau moyang *Grand- or great-grandparent* *f.* Cucu atau cicit *Grand- or great-grandchild* *g.* Adik-beradik *Siblings* *h.* Mertua *Parent-in-law* *i.* Menantu *Son- or Daughter in-law* *j.* Ipar-Duai *Brother- or Sister-in-law* *k.* Saudara-mara lain *Other relatives* *l.* Kawan *Friend* *m.* Pekerja (pembantu rumah, tukang kebun, pemandu, lain-lain) *Workers (live- in housemaid, gardener, driver, others)* *n.* Lain-lain *Others*
A0005	Umur *Age*	*a.* 18 - 25 *b.* 26 - 33 *c.* 34 - 41 *d.* 42 - 46 e. 50 or older
A0006	Bangsa *Ethnicity*	*a.* Melayu *Malay* *b.* Cina *Chinese* *c.* India *Indian* *d.* Lain-lain *Others*
A0007	Taraf kewarganegaraan *Citizenship status*	*a.* Warganegara Malaysia Malaysian Citizen *b.* Permastautin tetap Permanent Resident of Malaysia *c.* Bukan warganegara Malaysia Non-Malaysian Citizen

A0008	Taraf perkahwinan *Marital status*	*a.* Tidak pernah berkahwin *Never married* *b.* Berkahwin *Married* *c.* Berpisah *Separated* *d.* Janda Duda *Divorced* *e.* Balu *Widow/ Widower* *f.* Tinggal bersama pasangan *Living with partner*
A0009	Adakah anda bekerja? *Are you working?*	*a.* Ya *Yes* *b.* Tidak *No*
A0010	Jenis pekerjaan *Type of occupation* Pilih jawapan **UTAMA** sahaja. *Choose only* **ONE MAIN** *answer.*	*a.* Pekerja kerajaan *Government employee* *b.* Pekerja separa kerajaan *Semi-government employee* *c.* Pekerja swasta *Private employee* *d.* Bekerja sendiri *Self-employed* *e.* Pekerja tanpa gaji *Unpaid worker* *f.* Pekerja keluarga tanpa gaji *Unpaid family worker* *g.* Pelajar *Student*
A0011	Adakah anda sedang bekerja atau belajar dalam bidang Perubatan atau Perubatan Veterinar? *Are you working OR studying in Medical and Veterinary Medicine field (e.g. veterinarian, veterinary students, veterinary*	*a.* Ya *Yes* *b.* Tidak *No*

	assistant, medical doctors, medical students, nurses)?	
A0012	Jenis tempat tinggal *Type of house*	*a.* Rumah pangsa, pangsapuri, kondominium *Flat, apartment, condominium* *b.* Rumah sesebuah, banglo, rumah kampung *Detached house, bungalow, traditional house* *c.* Rumah bandar, teres, deret atau berangkai, rumah berkelompok *Town house, terrace, link house, cluster* *d.* Rumah berkembar *Semi-Detached* *e.* Rumah Kedai *Shop house* *f.* Rumah atas air *Water house* *g.* Rumah setinggan *Squatters* *h.* Rumah panjang *Longhouse*
A0013	Apakah status pemilikan rumah ini? *What is the ownership status of this house?*	a. Pemilikan sendiri *Owned* b. Disewa *Rented* c. Kuarters kakitangan kerajaan/majikan *Government/employer-provided staff quarters* d. Tinggal secara percuma di rumah yang dimiliki oleh orang yang bukan ahli isi rumah ini *Living for free in a house owned by non-household members*

A0014	Jumlah isi rumah yang tinggal di rumah ini? *Total number of people living in your household?*	Orang *People* _____
A0015	Adakah anda mempunyai anjing sebagai haiwan peliharaan? *Do you have any dog(s) as pets?*	a. Ya *Yes (please proceed to Section B)* 1 ekor *One* 2 ekor *Two* 3 ekor *Three* Lebih daripada 3 ekor *More than three* b. Tidak *No (please proceed to Section C)*

	SECTION B: HOUSEHOLD DOG POPULATION DYNAMICS AND WELFARE
B0001	Do you allow your dog(s) to roam freely outside without any supervision? *Adakah anda benarkan anjing peliharaan anda untuk dilepaskan ke luar tanpa pengawasan?* a. Never *Tidak pernah* b. Sometimes *Kadang kala* c. Always *Selalu*
B0002	Adakah anjing peliharaan anda telah diberi vaksinasi rabies? *Do you vaccinate your dog(s) against rabies?* a. Ya *Yes* b. Tidak *No*
B0003	Jika anda menjawab 'Tidak' pada soalan 25, mengapa? *If No, why?* a. Kos vaksinasi yang mahal *Vaccines are expensive* b. Vaksinasi tidak mudah didapati *Vaccines not available* c. Saya tidak tahu bahawa anjing boleh menerima vaksinasi rabies *I have no idea that dogs are vaccinated against rabies*
B0004	Bagaimanakah cara anda untuk merawat anjing peliharaan yang sakit? *How do you treat your dog(s) when they are sick?*

	a. Membawanya ke klinik veterinar *Taken to the veterinary clinics* b. Memberi ubat-ubatan sendiri di rumah *Give the medication at home by self* c. Merawat secara tradisional *Treat with traditional herbals* d. Membiarkan anjing pulih sendiri *Leave the dogs on their own*
B0005	Anjing betina peliharaan anda sedang/telah *Your female dogs is/are:* a. Bunting *Pregnant* b. Menyusu *Lactating / Nursing* c. Diamandulkan *Neutered / spayed* d. Tidak dimandulkan *Not spayed / Not neutered*
B0006	Anjing jantan peliharaan anda: *Your male dogs is/are:* a. Mandul *Castrated / neutered* b. *Tidak mandul Not castrated / Not neutered*

SECTION C: KNOWLEDGE OF RABIES TRANSMISSIONS, CLINICAL SIGNS, TREATMENT, PREVENTION AND CONTROL

KRITERIA KELAYAKAN: AHLI ISI RUMAH BERUMUR 13 TAHUN DAN KE ATAS

ELIGIBILITY CRITERIA: HOUSEHOLD MEMBERS AGED 13 YEARS AND ABOVE

Sila jawab **SEMUA** soalan

*Please answer **ALL** questions*

BAHAGIAN A *SECTION A*

N1001	Sila berikan jawapan anda bagi semua penyataan berikut: *Please give your answer for all of the following statements:*		
	N1001a	Penyakit rabies (penyakit anjing gila) daripada anjing boleh menjangkiti manusia *Rabies from dogs can infect humans*	*1.* Betul *True* *2.* Tidak pasti *Not sure* *3.* Salah *False*
	N1001b	Tanda-tanda anjing yang dijangkiti rabies ialah air liurnya meleleh dengan	*1.* Betul *True* *2.* Tidak pasti *Not sure* *3.* Salah *False*

		banyak dan berkelakuan ganas *Dogs that are infected with rabies show signs of profuse salivation and aggressive behaviour*	
	N1001c	Anda boleh dijangkiti rabies sekiranya digigit oleh anjing gila (anjing yang dijangkiti rabies) *You can get infected with rabies if you are bitten by a rabid dog (dog infected with rabies)*	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*
	N1001d	Luka manusia yang terdedah dengan air liur anjing gila boleh menyebabkan jangkitan rabies *Humans can be infected with rabies if their wounds are exposed to rabid dog's saliva*	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*
	N1001e	Cakaran anjing tidak boleh menyebarkan penyakit kepada manusia *Dog scratch cannot transmit disease to human*	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*
	N1001f	Sekiranya digigit oleh anjing, luka perlu dicuci dengan sabun dan air	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*

		mengalir sekurang-kurangnya 15 minit *If bitten by a dog, the wound should be washed with soap and running water for at least 15 minutes*	
	N1001g	Suntikan pencegahan tetanus adalah antara rawatan yang diberikan sekiranya digigit anjing *Tetanus booster shot is one of the treatments given for dog bites*	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*
	N1001h	Suntikan vaksin kepada anjing adalah untuk melindunginya daripada penyakit *Vaccination for dogs serves as a protection from disease*	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*
	N1001i	Rawatan segera di klinik atau hospital adalah perlu sekiranya digigit oleh anjing *Prompt treatment at a clinic or hospital is necessary if bitten by a dog*	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*
	N1001j	Malaysia tidak mempunyai akta khas yang melindungi kebajikan haiwan	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*

		Malaysia does not have a specific law that protects animal welfare	
	N1001k	Individu yang melakukan penganiayaan dan kekejaman ke atas haiwan boleh disabit kesalahan penjara dan/ atau denda. *Individuals who mistreat and abuse animals may be subjected to imprisonment and/ or fine*	1. Betul *True* 2. Tidak pasti *Not sure* 3. Salah *False*
N1002	Dalam tempoh 1 tahun yang lepas, pernahkah anda digigit atau dicakar mana-mana anjing? (Yang mengakibatkan luka) *Within the past 1 year, have you ever been bitten or scratched by any dog(s)? (Which caused an injury or a wound)*		1. Digigit anjing…**sila ke N1002a** *Bitten by a dog*…**please proceed to N1002a** 2. Dicakar anjing…**sila ke N1002a** *Scratched by a dog*…**please proceed to N1002a** 3. Tidak pernah dicakar atau digigit anjing…**sila ke N1003** *Never been scratched or bitten by dogs* … **please proceed to N1003**

	N1002a	Apakah tindakan awal anda? *What was your immediate action?* Jawapan boleh melebihi satu *More than one answer is accepted*	1. Tidak berbuat apa-apa *Do nothing* 2. Menggunakan antiseptik, minyak sapu atau membalut luka *Apply antiseptic, ointment or wound dressing* 3. Mencuci luka dengan air sahaja *Wash the wound using water only* 4. Cuci luka dengan air mengalir dan sabun **SELAMA** 15 minit *Wash the wound using running water and soap for **AT LEAST** 15 minutes* 5. Cuci luka dengan air mengalir dan sabun **KURANG DARIPADA** 15 minit *Wash the wound using running water and soap for **LESS THAN** 15 minutes*
	N1002b	Adakah anda mendapatkan rawatan di klinik atau hospital? *Did you seek treatment at a clinic or hospital?*	1. Ya *Yes* … **sila ke N1002b1** 2. Tidak *No* …**sila ke N1002b2**
	N1002b1	Bilakah anda mendapatkan rawatan di klinik atau hospital? *When did you seek treatment at the clinic or hospital?*	*1.* Serta-merta *Immediately* *2.* Dalam masa 24 jam *Within 24 hours* *3.* Lebih daripada 24 jam *After 24 hours* *4.* Mendapatkan rawatan setelah muncul gejala

		Pilih satu jawapan sahaja *Please choose one answer only*	(demam, bengkak, nanah, lesu, menggigil) *Seek treatment after symptom appears (fever, swelling, festering, fatigue, shivering)* …**sila ke N1004**
	N1002b2	Sebab tidak mendapatkan rawatan Jawapan boleh melebihi satu *Reason for not getting a treatment More than one answer is accepted*	1. Kecederaan tidak serius *The injury is not serious* 2. Anjing tersebut kelihatan sihat *The dog looks healthy* 3. Anjing tersebut telah divaksin *The dog has been vaccinated* 4. Tiada risiko sebarang jangkitan kepada saya *There is no risk of infection to me* 5. Tidak percaya keberkesanan rawatan klinik/ hospital *Does not believe in the effectiveness of the clinic/hospital treatment* 6. Jarak ke klinik/hospital sangat jauh *Distance to the clinic/hospital is far* 7. Masa menunggu yang lama *Long waiting time* 8. Kos rawatan yang mahal *The treatment cost is expensive* … **sila ke N1004**

<table>
<tr><td>N1003</td><td>Kepada mereka yang TIDAK PERNAH digigit atau dicakar oleh anjing.
For those who have NEVER been bitten or scratched by a dog

Apakah tindakan anda sekiranya digigit oleh anjing?
(Jawapan boleh melebihi satu)

What is your action if you were bitten by a dog?
(More than one answer is accepted)</td><td>1. Menggunakan antiseptik, minyak sapu atau membalut luka
Apply antiseptic, ointment or wound dressing
2. Membiarkan anjing menjilat luka gigitan
Let the dog lick the wound
3. Mencuci luka dengan air sahaja
Wash the wound using water only
4. Cuci luka dengan air mengalir dan sabun SELAMA 15 minit
Wash the wound using running water and soap for AT LEAST 15 minutes
5. Cuci luka dengan air mengalir dan sabun KURANG DARIPADA 15 minit
Wash the wound using running water and soap for LESS THAN 15 minutes
6. Mendapatkan rawatan tradisional
Seek traditional treatment
7. Mendapatkan rawatan di klinik atau hospital
Seek treatment at the clinic or hospital
8. Tidak mengambil tindakan seperti di atas
Do not perform any of the above actions</td></tr>
<tr><td>N1004</td><td colspan="2">Nyatakan pandangan anda bagi semua penyataan di bawah.
Please state your view on the following statements.</td></tr>
<tr><td></td><td>N1004a</td><td>Saya rasa tidak perlu rawatan pertolongan cemas (Contoh: menggunakan antiseptik, minyak sapu, membalut luka) setelah digigit oleh anjing.</td><td>1. Sangat tidak setuju Strongly disagree
2. Tidak setuju Disagree
3. Tidak pasti Not sure
4. Setuju Agree
5. Sangat setuju Strongly agree</td></tr>
</table>

		I don't think I need any first aid treatment (Examples: using antiseptic, ointment, wound dressing) after being bitten by a dog.	
	N1004b	Saya percaya anjing boleh menyebarkan penyakit kepada saya. *I believe dogs can spread diseases to me.*	1. Sangat tidak setuju *Strongly disagree* 2. Tidak setuju *Disagree* 3. Tidak pasti *Not sure* 4. Setuju *Agree* 5. Sangat setuju *Strongly agree*
	N1004c	Saya bimbang ahli keluarga yang mempunyai masalah kesihatan akan mudah mendapat penyakit daripada anjing. *I am worried that family members with health problems will be prone to contract diseases from dogs.*	1. Sangat tidak setuju *Strongly disagree* 2. Tidak setuju *Disagree* 3. Tidak pasti *Not sure* 4. Setuju *Agree* 5. Sangat setuju *Strongly agree*
	N1004d	Saya bimbang apabila kanak-kanak bermain bersama anjing jalanan/terbiar. *I am worried when children play with stray dogs.*	1. Sangat tidak setuju *Strongly disagree* 2. Tidak setuju *Disagree* 3. Tidak pasti *Not sure* 4. Setuju *Agree* 5. Sangat setuju *Strongly agree*
	N1004e	Pemakaian alat perlindungan diri (Contoh: sarung tangan, pencedok, kasut) ketika	1. Sangat tidak setuju *Strongly disagree* 2. Tidak setuju *Disagree* 3. Tidak pasti *Not sure*

		membersihkan najis anjing peliharaan adalah tidak penting. *The use of personal protective equipment (Examples: gloves, scoop, shoes/slippers) while cleaning the pet dog's waste is not important.*	4. Setuju *Agree* 5. Sangat setuju *Strongly agree*
	N1004f	Pemilik anjing perlu membawa anjing peliharaan mereka ke klinik haiwan untuk mendapatkan suntikan vaksin setiap tahun. *Dog owners need to bring their pet dog(s) to the veterinary clinic for annual vaccination.*	1. Sangat tidak setuju *Strongly disagree* 2. Tidak setuju *Disagree* 3. Tidak pasti *Not sure* 4. Setuju *Agree* 5. Sangat setuju *Strongly agree*
	N1004g	Saya perlu dapatkan suntikan vaksin rabies sekiranya digigit oleh anjing liar di kawasan yang mempunyai kes rabies. *I need to get vaccinated against rabies if I was bitten by a stray dog within an area that has rabies cases.*	1. Sangat tidak setuju *Strongly disagree* 2. Tidak setuju *Disagree* 3. Tidak pasti *Not sure* 4. Setuju *Agree* 5. Sangat setuju *Strongly agree*
	N1004h	Anjing di kawasan yang mempunyai kes rabies perlu mendapatkan vaksin pencegahan rabies. *Dogs within the area with rabies cases need*	1. Sangat tidak setuju *Strongly disagree* 2. Tidak setuju *Disagree* 3. Tidak pasti *Not sure* 4. Setuju *Agree* 5. Sangat setuju *Strongly agree*

		to be vaccinated against rabies.	