



**UNIVERSITI PUTRA MALAYSIA**

**PURCHASING BEHAVIOUR OF MEDICINE, HERBAL PREPARATIONS  
AND HEALTH SUPPLEMENTS FOR ANIMALS THROUGH THE  
E-COMMERCE PLATFORM BY PET OWNERS IN THE KLANG VALLEY**

**MUHAMMAD NUR IKHWAN BIN ASHA**

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FPV 2023 7**

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**MUHAMMAD NUR IKHWAN BIN ASHA**

A project paper submitted to the  
Faculty of Veterinary Medicine, Universiti Putra Malaysia

In partial fulfilment of the requirement for the  
**DEGREE OF DOCTOR OF VETERINARY MEDICINE**

Universiti Putra Malaysia

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**DECEMBER 2023**

## CERTIFICATION

It is hereby certified that we have read this project paper entitled “PURCHASING BEHAVIOUR OF MEDICINE, HERBAL PREPARATIONS AND HEALTH SUPPLEMENTS FOR ANIMALS THROUGH THE E-COMMERCE PLATFORM BY PET OWNERS IN THE KLANG VALLEY”, by Muhammad Nur Ikhwan bin Asha and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfilment of the requirement for the course VPD 4991- Project.

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## DEDICATION

This thesis is especially dedicated to:

My beloved parents (Asha Bin Ahmad Asiri and Nor Azlina Binti Busu)

My respected supervisor (Dr Wan Mastura Shaik Mohamed Mossadeq)

My fellow DVM friends



## ACKNOWLEDGEMENT

In the name of Allah, the most merciful, the most gracious, the One who gave me strength through these trying times, so that I am able to complete this project.

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**LIST OF ABBREVIATIONS**

<b>CI</b>	Confidence Interval
<b>DCA</b>	Drug Control Authority
<b>DVS</b>	Department of Veterinary Services
<b>Ha</b>	Alternative Hypothesis
<b>Ho</b>	Null Hypothesis
<b>NPRA</b>	National Pharmaceutical Regulatory Agency
<b>OR</b>	Odd Ratio
<b>OTC</b>	Over-the-counter
<b>p</b>	P-value
<b>REGOVP</b>	Registration Guideline of Veterinary Products
<b>r</b>	Pearson Correlation
<b>N</b>	Sample Size
<b>SPSS</b>	Statistical Package for the Social Sciences
<b>UPM</b>	Universiti Putra Malaysia
<b>WHO</b>	World Health Organization

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**ABSTRAK**

Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4991 – Projek Tahun Akhir

**TINGKAH LAKU PEMBELIAN UBATAN, PENYEDIAAN HERBA DAN SUPLEMEN KESIHATAN UNTUK HAIWAN MELALUI PLATFORM E-DAGANG OLEH PEMILIK HAIWAN DI LEMBAH KLANG**

Oleh

**Muhammad Nur Ikhwan bin Asha**

2023

**Penyelia : Dr Wan Mastura Shaik Mohamed Mossadeq****Penyelia Bersama : Dr Mohammed Sadiq Babatunde  
Dr Ku Nurul Atiqah Ku Azir**

Kemunculan e-dagang yang semakin popular selepas penularan wabak COVID-19 telah memberi dorongan kepada pertumbuhan industri kesihatan haiwan secara global, dengan menawarkan kemudahan kepada pengguna untuk membeli produk kesihatan haiwan tanpa mengira masa dan tempat. Kajian ini bertujuan untuk menilai tingkah laku pembelian oleh pemilik haiwan terhadap produk-produk kesihatan haiwan melalui platform e-dagang dan menilai tahap pengetahuan dan kesedaran mereka mengenai potensi penyalahgunaan ubatan haiwan yang dijual secara atas talian. Sejumlah 137 daripada 145 responden di Lembah Klang telah meyeritai tinjauan ini, dengan kadar respons sebanyak 94.5%. Berdasarkan tinjauan, 79 daripada 137 (57.7%) responden pernah membeli produk kesihatan haiwan melalui platform e-dagang, sementara 51 daripada 79 (64.6%) responden menunjukkan kecenderungan tinggi untuk terus membeli produk-produk

tersebut melalui platform e-dagang pada masa depan. Sebanyak 80.3% daripada responden menyedari risiko kesihatan yang berkait dengan produk kesihatan haiwan yang terdapat di platform e-dagang. Analisis model univariat antara kecenderungan responden terhadap penggunaan platform dalam talian dan latar belakang sosiodemografi memberikan hubungan yang tidak signifikan ( $p > 0.1$ ). Terdapat korelasi positif yang sederhana antara tahap keprihatinan pemilik haiwan dan kesedaran mereka untuk mendapatkan konsultasi veterinar untuk haiwan peliharaan mereka ( $r = 0.520$ ,  $p < 0.05$ ). Walau bagaimanapun, tiada korelasi signifikan antara kecenderungan untuk membeli ubatan haiwan secara atas talian dan tahap keprihatinan pemilik haiwan serta kesedaran mereka terhadap keperluan untuk mendapatkan konsultasi veterinar ( $p > 0.05$ ). Kesimpulannya, kajian ini mendedahkan tingkah laku pembelian pemilik haiwan melalui e-dagang, menekankan keperluan untuk mendapatkan konsultasi veterinar bagi mengelakkan pembelian produk yang tidak bersijil dan palsu yang mempunyai risiko kesihatan terhadap haiwan peliharaan mereka.

*Kata kunci:* e-dagang, ubatan haiwan, kesedaran, konsultasi

**ABSTRACT**

An abstract of the project paper to the Faculty of Veterinary Medicine in partial fulfillment of the course VPD 4991 – Final Year Project

**PURCHASING BEHAVIOUR OF MEDICINE, HERBAL PREPARATIONS  
AND HEALTH SUPPLEMENTS FOR ANIMALS THROUGH THE E-  
COMMERCE PLATFORM BY PET OWNERS IN THE KLANG VALLEY****By****Muhammad Nur Ikhwan bin Asha****2023****Supervisor : Dr Wan Mastura Shaik Mohamed Mossadeq****Co-supervisors : Dr Mohammed Sadiq Babatunde  
Dr Ku Nurul Atiqah Ku Azir**

E-commerce's surge in popularity post-COVID-19 has fuelled global industry growth, offering convenience for consumers to purchase animal health products anytime, anywhere. This study assessed the pet owners' purchasing behaviour of these items through e-commerce platforms and evaluated their level of knowledge and awareness regarding the potential misuse and abuse of the pet medicine sold online. A total of 137 out of 145 respondents in Klang Valley completed the survey, producing a response rate of 94.5%. Based on the survey, 79 out of 137 (57.7%) respondents have purchased animal health products through an e-commerce platform, while 51 out of 79 (64.6%) respondents expressed a high tendency to continue purchasing those items online in the future. Approximately 80.3% of the respondents are aware of the potential health risks associated with animal health products that are available on e-commerce platforms. Analysis of

univariable models between the preferences of respondents towards online platforms and socio-demographic variables results in a non-significant association ( $p > 0.1$ ). There is a moderately positive correlation between the concern of pet owners and their awareness of seeking veterinary consultation ( $r = 0.520$ ,  $p < 0.05$ ). However, there is no significant correlation between preferences for purchasing medicine online and the level of concern of pet owners and their awareness of the need for veterinary consultation ( $p > 0.05$ ). In conclusion, this study reveals pet owners' e-commerce purchasing habits, emphasising the need for veterinary consultation to avoid purchasing non-certified and counterfeit products that may be hazardous to their pet's health.

*Keywords:* e-commerce, pet medicine, awareness, consultation

## CHAPTER 1 INTRODUCTION

E-commerce, commonly known as electronic commerce, has become a significant avenue for acquiring goods and services. The surge in online shopping gained remarkable momentum during the COVID-19 pandemic, which was officially declared by the World Health Organization on March 11, 2020 (Cucinotta et al., 2020). Despite the reopening of physical stores globally after the lifting of movement restrictions, the preference for online shopping persisted. This continuous trend is likely attributable to consumers' positive experiences and satisfaction with online shopping during the pandemic, fostering a habit that endures even post-restrictions (Shaw et al., 2022).

Moreover, the sudden rise in popularity of e-commerce platforms, coupled with consumers' desire for privacy and convenience in procuring products without the need for veterinary consultations or lengthy commutes, led to the introduction of various over-the-counter medicines, herbal preparations, and health supplements tailored for animals. Beyond the convenience of purchase, these platforms offer viable alternatives for consumers who value the freedom to compare and select products within their budget.

However, the abundance of health products available for online purchase raises concerns. A considerable portion of these items may lack authenticity or certification from local authorities, posing potential risks to the health of animals. According to Garcia et al. (2020), veterinary antibiotics, including the highest priority critically important antimicrobials, are easily accessible through online platforms in the United States of America and South America.

Compounding this issue is the tendency of some consumers to self-diagnose their pets' health conditions and obtain products and services based on their interpretation of online medical information (Fittler et al., 2018). Furthermore, purchasing animal medication, herbal preparations, and health supplements without proper veterinary consultation and prescription may result in drug abuse, increased antimicrobial resistance, adverse side effects, and even fatalities in animals.

As of now, there is a lack of data on the purchasing behaviour of pet owners in Malaysia regarding medicine, herbal preparations, and health supplements for animals through e-commerce platforms. Consequently, this study aims to evaluate pet owners' knowledge and awareness of online purchases of these health products for animals, including the potential for misuse and abuse.

The specific objectives were:

- i. To determine the purchasing behaviour of pet owners regarding animal medicine, herbal preparations and health supplements via the online platform.
- ii. To assess pet owners' knowledge and awareness about potential misuse and abuse of medicine, herbal preparations and health supplements in animals purchased via the online platform.

Research hypotheses:

Ho<sub>1</sub>: Pet owners have not purchased any medicine, herbal preparations or supplements for their pets via the online platform

Ha<sub>1</sub>: Pet owners have purchased medicine, herbal preparations or supplements for their pets via the online platform

Ho<sub>2</sub>: Pet owners are not aware of the potential misuse and abuse of medicine, herbal preparations or supplements purchased via the online platform

Ha<sub>2</sub>: Pet owners are aware of the potential misuse and abuse of medicine, herbal preparations or supplements purchased via the online platform.



## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 E-commerce growth

In recent years, e-commerce has evolved into an essential component of the global retail landscape. Much like various other industries, the buying and selling of goods have undergone significant transformations with the rise of the internet. The projected estimate for retail e-commerce sales in 2022 surpassed 5.7 trillion U.S. dollars on a global scale, and this figure is anticipated to reach even greater heights in the upcoming years (Gelder, 2023). In addition, the majority of digital commerce website visits globally are initiated through mobile phones, and they also contribute significantly to the highest percentage of orders (Chevalier, 2023). In the same study, it is stated that in the first quarter of 2023, smart phones constituted approximately 74 percent of retail site traffic on a global scale, and were responsible for generating 63 percent of online shopping orders.

In Malaysia, the number of smart phone users is expected to surpass 30 million individuals by the year 2025, and 98 percent of Malaysian consumers are connected through the internet via their hand-held phones (Statista, 2023). A survey by the Malaysian Communication and Multimedia Commission in 2017 (MCMC, 2017) showed that 24.5 million online consumers with smart phone in Malaysia, have used their devices as the main tool used to surf the internet. Thus, the high number of phone users in Malaysia may lead to the increased trend of using e-commerce to purchase goods. Furthermore, the wide use of online bank transfer by businesses and consumers, has contributed to the increase of online consumers in Malaysia too (Lohse, 1998). As a result, an expanding number of consumers are

becoming increasingly acquainted with the internet. Consequently, online shopping is gaining popularity and becoming the preferred choice among consumer groups seeking enhanced value propositions related to information, convenience, costs, and variety (Mutum, 2006).

## **2.2 Regulations of veterinary products**

According to Paragraph 7(1)(a) of the Control of Drugs and Cosmetics (Amendment) Regulations 2006, all products need to be registered with the Drug Control Authority (DCA) prior to being manufactured, sold, supplied, imported, possessed or administered, unless the product is exempted under the specific provisions of the Regulations (REGOVP, 2014). Products in this regulation can be defined as: (a) a drug in a dosage unit or otherwise, for use wholly or mainly by being administered to one or more human beings or animals for a medicinal purpose; (b) a drug to be used as an ingredient of a preparation for a medicinal purpose.

In the veterinary field, products containing scheduled poison (as in the First Schedule of Poison Act 1952), non-scheduled poison (over-the-counter, OTC), pesticides either for internal or external use, are controlled by National Pharmaceutical Regulatory Agency (NPRA). On the other hand, the Department of Veterinary Services (DVS) are authorized to control products containing animal feed, feed additives, health or dietary supplement, and also herbal or natural preparation for animals. The Pesticide Board in specific, are authorized to control veterinary products that contain pesticides for external use only as listed under the First Schedule of Pesticide Act 1974. These regulatory bodies work in tandem to control the registration of veterinary products in Malaysia.

### **2.3 Pet health products in online platform**

The proliferation of internet services has significantly increased the accessibility of online sales for medicines, allowing consumers to easily obtain them through various e-commerce platforms (Pilus, 2021). However, The Health Ministry of Malaysia has emphasized that certain medications abundantly sold on e-commerce platforms nowadays are tainted with prohibited substances (Mackey, 2016). The ministry has cautioned that these products might be counterfeit or fake health items, thereby posing risks to patient safety and potentially contributing to the misuse of prescription drugs. The World Health Organization (WHO) has estimated that approximately 10% of medicines sold worldwide through online suppliers may be counterfeit (Fittler, 2018). This percentage vary from one country to another, with less than 1% occurrence in developed countries and exceeding 30% in Africa, Asia, India, and Latin America. In addition, more than 90% of prescription medicine were not registered with the DCA (Pilus, 2021). However, data regarding pet health products on online platform is not widely available. Therefore, there is a need to assess the availability of pet health products sold on e-commerce platforms and the Malaysian pet owners' knowledge, attitude and practices toward this matter.

## CHAPTER 3

### METHODOLOGY

#### 3.1. Study design

The study design was based on the quantitative and cross-sectional approach.

#### 3.2. Study location

The survey was distributed physically to random pet owners in Klang Valley. The area was specifically chosen for the survey as the majority of its residents have ready access to veterinary services and e-commerce platforms aside from owning high purchasing power compared to other areas in the state.

#### 3.3. Study duration

The study was conducted for a period of 3 weeks beginning 28<sup>th</sup> of August 2023 to 11<sup>th</sup> of September 2023.

#### 3.4. Study population

This survey was distributed to pet owners in the Klang Valley area and those who visited the two veterinary clinics located in Shah Alam, Selangor and Setiawangsa, Kuala Lumpur. Both clinics are located in the Klang Valley and are heavily frequented by pet owners.

##### 3.4.1. Inclusion criteria

Malaysian pet owners aged 18 years old and above, that currently reside in Klang Valley.

### **3.4.2. Exclusion criteria**

Individuals that are non-pet owners, not resident of Klang Valley, and participants aged under 18 years old.

### **3.4.3. Sampling method**

Convenience sampling method was used in this study.

### **3.4.4. Sample size**

A total of 145 copies of questionnaires were distributed physically to random pet owners who reside within the sampling area.

## **3.5. Study instruments**

A bi-lingual (Bahasa Malaysia and English) structured and validated questionnaires with open, close-ended, multiple choice, and questions that have a Likert-scale statement was used to collect the data regarding socio-demographic profile of respondents, knowledge of respondents towards availability of animal medicine, herbal preparations and supplements on online platforms, as well as its hazardous potential on the health of their pets.

### **3.5.1. Components of the questionnaire**

The questionnaires were divided into four sections that include the following: Socio-demographic profile (Section A), knowledge and attitude of respondents towards pet management and general healthcare (Section B), knowledge of respondents towards availability of animal medicine, herbal preparations and health supplements on e-commerce platform (Section C), and knowledge of respondents towards the potential misuse and abuse of medicine, herbal preparations or health supplements purchased via e-commerce platforms on the health of their pets (Section D).

**Section A: Socio-demographic profile**

The questions in this section include gender, age, ethnicity, education level, number of person in household, income per household, and field of work.

**Section B: Knowledge and attitude of respondents towards pet management and general healthcare**

This section consists of six questions. The respondents' knowledge and attitudes toward general pet management was assessed, such as the type of pet currently owned, number of years as pet owner, the likeliness to consult veterinarian, and frequency of purchasing pet medicine, herbal preparation or health supplement.

**Section C: Knowledge of respondents towards availability of animal medicine, herbal preparations and health supplements on e-commerce platform**

This section consists of seven questions. The knowledge of respondents regarding the accessibility of animal medicine, herbal preparations, and health supplements on e-commerce platforms was assessed, including their experience in purchasing pet health product online, factors that influence them, drawbacks of purchasing online and level of satisfaction regarding their recent use and purchase of the items. However, respondents that have never experienced purchasing any pet health products online were instructed to skip this section.

**Section D: Knowledge of respondents towards the potential misuse and abuse of medicine, herbal preparations or health supplements purchased via e-commerce platforms on the health of their pets**

This section consists of eight questions. The respondents' awareness regarding the possible misuse and abuse of medicine, herbal preparations, or health supplements purchased through the e-commerce platforms and its impact on the health of their pets were assessed.

### **3.6. Variables**

#### **3.6.1. Dependent variables**

The dependent variables include: concern of respondents toward their pets, preferences of purchasing medicine, herbal preparation and health supplement of pets through e-commerce platform, and awareness and likelihood of respondents to consult a veterinarian about matters pertaining to the health of their pets.

#### **3.6.2. Independent variables**

The independent variables include: gender, age, ethnicity, education level, number of person in household, income per household, and field of work.

### **3.7. Quality control**

#### **3.7.1. Validity**

The supervisory committee evaluated the study instrument, and comments and corrections were noted and appropriated.

#### **3.7.2. Reliability**

Feedbacks regarding the clarity of instructions and questions of the survey as well as issues raised were gathered from the respondents and addressed prior to the commencement of the actual study.

### 3.8. Data analysis

The data gathered from completed surveys were tabulated in MS Excel<sup>®</sup> and analysed using IBM SPSS<sup>®</sup> version 26. Descriptive statistics were employed to summarize the dataset, encompassing the demographic profiles of respondents and their responses across the four sections of the questionnaire. To gauge data normality, skewness and kurtosis levels were assessed, and variables were presented as mean and standard deviation or median and interquartile range, depending on normality outcomes. Categorical variables were articulated as frequencies and percentages.

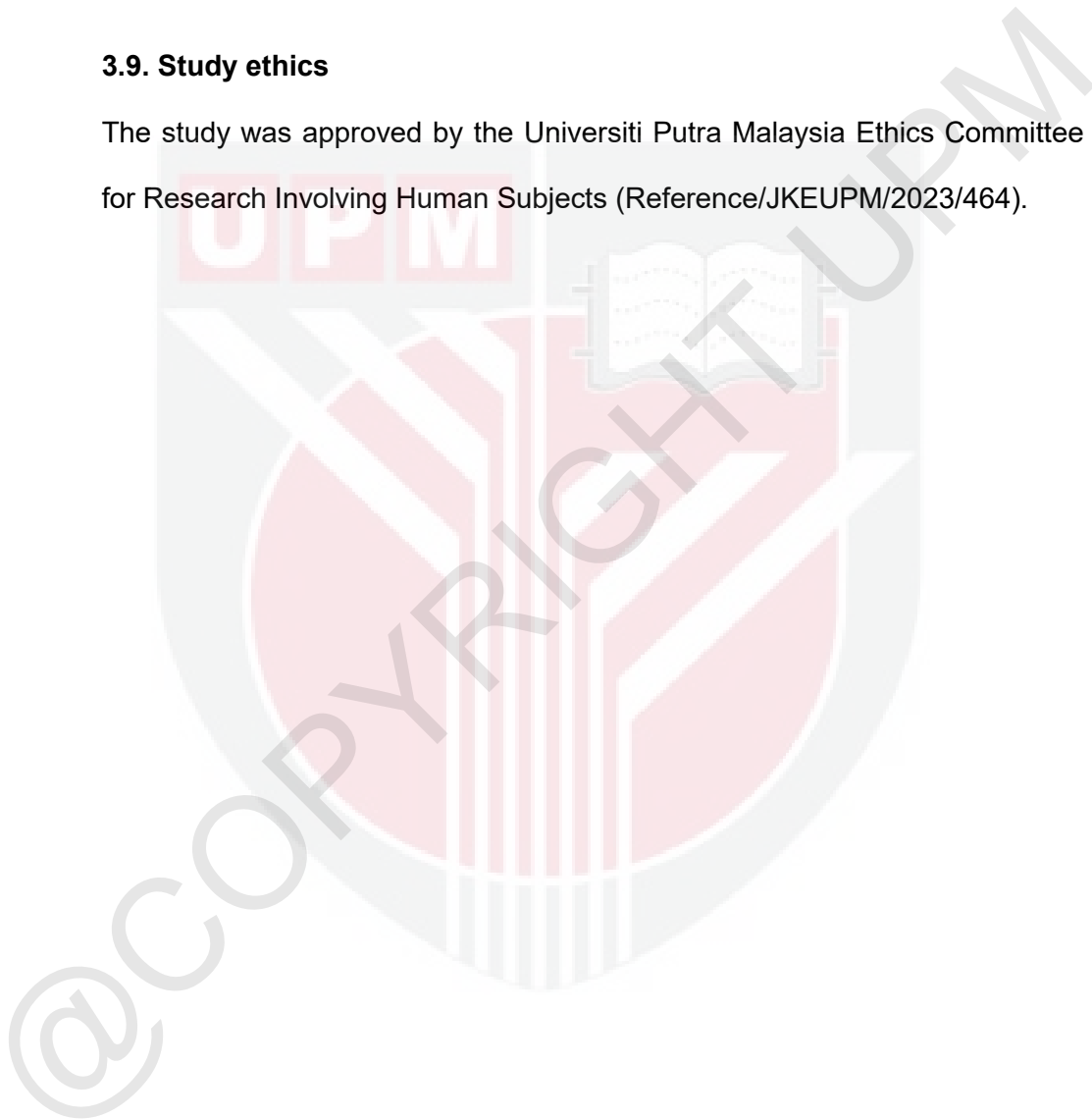
In the analysis, each section's items and questions were examined descriptively to identify their frequency distribution. Cumulative scores were calculated for items presented on a 5-point Likert scale, and specific scores (0 or 1) were assigned to items with dichotomous options, indicating incorrect or correct answers. Overall scores were then derived, and the mean value was utilized to classify dependent variables into binary outcomes (e.g., low and high preferences for online purchasing or good versus poor knowledge and attitude). Subsequently, binary logistic regression models were employed to assess the relationship between these dependent variables and socio-demographic factors of the respondents.

The correlation among pet owners' concerns, awareness of the need for veterinary consultation, and preferences for online purchases was established through Pearson's coefficient correlation analysis. Concurrently, binary logistic regression models were formulated to ascertain the association between each dependent variable and respondents' socio-demographic factors (Section A), knowledge and attitude regarding pet management and general healthcare (Section B), and awareness of potential

abuse and misuse of medicine, herbal supplements, and health preparations purchased online (Section D). Both univariate and multivariate models were constructed, with significance levels set at  $p < 0.1$  and  $p < 0.05$ , respectively.

### **3.9. Study ethics**

The study was approved by the Universiti Putra Malaysia Ethics Committee for Research Involving Human Subjects (Reference/JKEUPM/2023/464).



## CHAPTER 4

### RESULTS

#### 4.1 Descriptive

##### 4.1.1 Response rate

Data was collected from 137 out of 145 eligible respondents, giving a response rate of 94.5%, since a few questionnaires were found incomplete and therefore were excluded from the analysis. However, the number of samples included in the study (N=137) was within the acceptable range required (a minimum of 132 respondents), based on sample size calculation by means of G\*Power™ version 3.1.9.7.

$$\text{Response rate} = \frac{\text{Number of completed questionnaires}}{\text{Number of eligible respondents}} \times 100$$

$$= 137/145 \times 100 = 94.5\%$$

##### 4.1.2 Socio-demographic characteristics

The respondents' socio-demographic characteristics are shown in Table 4.1. The number of female respondents exceeded males by 58.4%. Majority (61.3%) of the respondents are between 18-29 years old while only 4.4% of the respondents are more than 50 years old. Most of the respondents are Malay (88.3%) and completed tertiary education (89.1%). About half of the respondents (49.7%) belongs to a household of one to three persons. The respondents under the M40 and B40 income level category at 43.1% and 32.1%, respectively.

**Table 4.1: Section A - Demographic profile of respondents (N=137)**

Characteristic	Number of Respondents	Percentage (%)
Gender		
Male	57	41.6

Female	80	58.4
<b>Age (Years)</b>		
18-29	84	61.3
30-39	26	19
40-49	21	15.3
>50	6	4.4
<b>Ethnicity</b>		
Malay	121	88.3
Chinese	10	7.3
Indian	1	0.7
Others	5	3.7
<b>Education Level</b>		
Primary	0	0
Secondary	15	10.9
Tertiary	122	89.1
<b>Number of Person in Household</b>		
1-3	68	49.7
4-6	55	40.1
7-9	14	10.2
<b>Category of Household Income</b>		
B40	44	32.1
M40	59	43.1
T20	34	24.8
<b>Field of Work</b>		
Professional	66	48.2
Business/Self- employed	15	11
Student	38	27.7
Others	18	13.1

#### **4.1.3 Knowledge and attitude of respondents towards pet management and general healthcare**

According to the data presented in Table 4.2, a substantial percentage (96.4%) of respondents owned one or more cats. Among these cat owners, 69.3% keep one to five cats at home. In terms of the duration of pet ownership, 48.9% of total respondents owned pets between a period of one and five years, while 24.1% had surpassed the 11-year pet-ownership mark.

A total of 46.7% of respondents purchase pet health products at least once every three months, with a notable 38.7% of these owners buying the items exclusively when their pet(s) are unwell. Animal medications are the most purchased items (73%), followed by health supplements (49.6%), and herbal preparations (10.9%). Nevertheless, the majority (81%) of respondents prefer acquiring these items from a veterinary clinic.

Results in Table 4.5 show that 65.7% out of 137 respondents expressed a high level of concern for the overall well-being of their pets. Specifically, wellness (94.9%) and health (94.8%) emerged as the primary aspects of concern, closely followed by hygiene (94.2%) and comfort (94.2%). However, nutritional, physical activity, and energy aspects were perceived as less critical compared to the aforementioned factors.

**Table 4.2: Section B- Knowledge and attitudes of respondents towards pet management and general healthcare (N=137).**

Characteristic		Number of Respondents	Percentage (%)
<b>Type of pet currently owned</b>			
Cat	Yes	132	96.4
	No	5	3.6
Dog	Yes	3	2.2
	No	134	97.8
Others	Yes	10	7.3
	No	127	92.7
<b>Number of pets owned</b>			
Cat	0	5	3.6
	1-5	98	71.5
	6-15	25	18.2
	>16	9	6.7
Dog	1-5	3	100
	6-15	0	0
	>16	0	0
Others	1-5	9	90
	6-15	1	10

	>16	0	0
<b>Number of years as a pet owner</b>			
1-5	67		48.9
6-10	37		27
>11	33		24.1
<b>How likely are you to visit a veterinarian for consultation when your pet falls sick?</b>			
Very unlikely	0		0
Unlikely	5		3.6
Neutral	11		8.0
Likely	30		22
Very likely	91		66.4
<b>How often do you purchase medicine, herbal preparations or health supplements for your pets?</b>			
1-3 month (s)	64		46.7
4-6 months	18		13.1
Only when my pet is sick	53		38.7
I have not purchased any	2		1.5
<b>Please specify category of items purchased</b>			
Medicines	Yes	100	73
	No	37	27
Herbal preparation	Yes	15	10.9
	No	122	89.1
Health supplement	Yes	68	49.6
	No	69	50.4
<b>Where do you usually purchase medicine, herbal preparations or health supplements for your pets?</b>			
Veterinary clinic	Yes	111	81
	No	26	19
Pet shop	Yes	70	51.1
	No	67	48.9
Convenient store/supermarket	Yes	5	3.6
	No	132	96.4
E-commerce (Online)	Yes	40	29.2
	No	97	70.8
<b>When it comes to your pet's well-being, what are your concerns?</b>			
<b>Health</b>			
Not important		1	0.7
Least important		0	0
Neutral		6	4.4
Important		25	18.2
Very Important		105	76.6
<b>Energy</b>			
Not important		1	0.7

Least important	0	0
Neutral	19	13.9
Important	51	37.2
Very Important	66	48.2
<b>Physical activity</b>		
Not important	1	0.7
Least important	1	0.7
Neutral	22	16.1
Important	53	38.7
Very Important	60	43.8
<b>Wellness</b>		
Not important	0	0
Least important	1	0.7
Neutral	6	4.4
Important	43	31.4
Very Important	87	63.5
<b>Hygiene</b>		
Not important	2	1.5
Least important	0	0
Neutral	6	4.4
Important	40	29.2
Very Important	89	65.0
<b>Nutrition</b>		
Not important	1	0.7
Least important	0	0
Neutral	12	8.8
Important	44	32.1
Very Important	80	58.4
<b>Comfort</b>		
Not important	0	0
Least important	2	1.5
Neutral	6	4.4
Important	40	29.2
Very Important	89	65

#### **4.1.4 Knowledge of respondents towards availability of animal medicine, herbal preparations and health supplements on e-commerce platform**

As depicted in Table 4.3, a significant percentage (57.7%) of respondents (n=79) have acquired medicines, herbal preparations, and health supplements for their pets through e-commerce platforms. Among these 79

respondents, 72.2% opted for purchasing animal health products due to promotions and discounts provided by the e-commerce platforms, closely followed by the wide availability and diverse range of products, which appealed to 70.9%. Additionally, 40.5% of respondents acknowledged that concerns about product quality and authenticity represented the main drawbacks of procuring pet health products online.

In terms of satisfaction, a notable 67.1% of respondents, with a median score of 4, expressed contentment with their recent purchase of pet medicine, herbal preparations, or health supplements through an e-commerce platform. Furthermore, a significant majority (88.5%) of respondents, with a median score of 3, indicated a likelihood to recommend purchasing these items for pets through e-commerce platforms to other pet owners. More than half (59.5%) of the 79 respondents (median score of 4), expressed an inclination to continue purchasing these products through e-commerce platforms in the future.

**Table 4.3: Section C- Knowledge of respondents towards availability of animal medicine, herbal preparations and health supplements on e-commerce platform (n=79)**

Characteristic	Number of Respondents	Percentage (%)
Have you ever purchased medicine, herbal preparations or health supplements for your pets through an e-commerce platform?		
Yes	79	57.7
No	58	42.3
What are the factors that influence your decision to purchase medicine, herbal preparations or health supplements for your pets through an e-commerce platform?		
Availability and variety of the products offered	Yes	70.9
	No	29.1
Cost Savings and Promotions	Yes	72.2
	No	27.8

Convenience and Speed	Yes	50	63.3
	No	29	36.7
Reviews and recommendation	Yes	46	58.2
	No	33	41.8
What are the disadvantages that you see in purchasing medicine, herbal preparations or health supplements for your pets through an e-commerce platform?			
Product Quality and authenticity	Yes	32	40.5
	No	47	59.5
Safety and Health Risks	Yes	14	17.7
	No	65	82.3
Lack of Information	Yes	19	24.1
	No	60	75.9
Delivery and Shipping Issues	Yes	10	12.7
	No	69	87.3
Are you satisfied with your most recent purchase of medicine, herbal preparations or health supplements for your pets through an e-commerce platform?			
Very unsatisfied		1	1.3
Unsatisfied		4	5
Neutral		21	26.6
Satisfied		38	48.1
Very satisfied		15	19
How likely would you recommend purchasing medicine, herbal preparations or health supplements for pets through an e-commerce platform to other pet owners?			
Very unlikely		7	9
Unlikely		2	2.5
Neutral		31	39.2
Likely		31	39.2
Very likely		8	10.1
How likely are you to continue purchasing medicine, herbal preparations or health supplements for your pets through an e-commerce platform in the future?			
Very unlikely		6	7.6
Unlikely		0	0
Neutral		26	32.9
Likely		33	41.8
Very likely		14	17.7

#### **4.1.5 Knowledge of respondents towards the potential misuse and abuse of medicine, herbal preparations or health supplements purchased via e-commerce platforms on the health of their pets**

According to the data in Table 4.4, most respondents (75.9%, median=4) knew the difference in quality and safety standards between branded and generic medicines, herbal preparations, or health supplements for pets. Additionally, a large majority (78.8%, median=4) were aware that using over-the-counter products incorrectly could harm their pets.

Pertaining to the respondents' practice in seeking veterinary advice, about 69.3% of respondents (median=4) expressed their interest in consulting a veterinarian before purchasing health products for their pets from e-commerce platforms. Furthermore, 80.3% (median=4) were aware of the potential health risks as a result of not seeking proper veterinary consultation. Out of 137 respondents, 80.3% knew about the potential risks of buying pet products through e-commerce platforms, while 12.4% were unsure.

Regarding the respondents' personal experience in online purchase of products, most respondents (83.2%) reported that their pets displayed no negative effects after the use of pet health products purchased from e-commerce platforms. A total of 59.1% of these respondents (median=3) were willing to continue purchasing the medicine despite the risks. On the other hand, around 52.6% had mixed feelings and were cautious about purchasing healthcare products for their pets via the e-commerce platforms.

**Table 4.4: Section D- Knowledge of respondents towards potential of misuse and abuse of medicine, herbal preparations or health supplements purchased via e-commerce on the health of their pets (N=137)**

Characteristic	Number of Respondents	Percentage (%)
Are you aware of the differences in quality and safety standards between branded and generic medicine, herbal preparations or health supplements for pets?		
Very unaware	6	4.4

Unaware	4	2.9
Neutral	23	16.8
Aware	59	43.1
Very aware	45	32.8
Are you aware that some over-the-counter medicine, herbal preparations or health supplements can have harmful effects on your pets if not used correctly?		
Very unaware	4	3
Unaware	8	5.8
Neutral	17	12.4
Aware	48	35
Very aware	60	43.8
How likely would you consult a veterinarian before purchasing medicine, herbal preparations or health supplements from e-commerce platforms for your pets?		
Very unlikely	2	1.5
Unlikely	15	11
Neutral	25	18.2
Likely	40	29.2
Very likely	55	40.1
Are you aware of the potential consequences of giving your pets medicine, herbal preparations or health supplements without consulting a veterinarian?		
Very unaware	3	2.2
Unaware	6	4.4
Neutral	18	13.1
Aware	50	36.5
Very aware	60	43.8
Are you aware of the potential health risks associated with medicine, herbal preparations or health supplements purchased for pets through e-commerce platforms?		
Yes	110	80.3
No	10	7.3
Maybe	17	12.4
Have your pets ever experienced any negative side effects after the use of medicine, herbal preparations or health supplements purchased through an e-commerce platform?		
Yes	10	7.3
No	114	83.2
Maybe	13	9.5
How likely are you to continue purchasing medicine, herbal preparations or health supplements through an e-commerce platform despite the potential health risks to your pets?		
Very unlikely	39	28.5
Unlikely	17	12.4
Neutral	50	36.5
Likely	26	19
Very likely	5	3.6
What is your opinion on purchasing medicine, herbal preparations or health supplements		

through an e-commerce platform?		
Positive	25	18.2
Mixed/Cautious	72	52.6
Negative	29	21.2
No opinion	11	8.0

## 4.2 Dependent variables

### 4.2.1 Concern of respondents toward their pets

Based on table 4.5, slightly more than half of the respondents (65.7%) were highly concerned for their pet's wellbeing compared to 34.3% of them who had low concern (refer appendices for questions).

**Table 4.5: Three dependent variables from questions with a 5-point Likert scale in Sections B, C, and D**

Likert scale (score 1 to 5)	Section	Category	Outcome	Frequency (%)
Q8	B	Concern of respondents toward their pets	Low concern	47 (34.3)
			Highly concerned	90 (65.7)
Q4	C	Preferences of purchasing medicine, herbal preparation and health supplement of pets through e-commerce platform *	Low preferences	28 (35.4)
Q5			High preferences	51 (64.6)
Q6				
Q4	B	Awareness and practices of respondents to have consultation from veterinary doctor about their pets	Low	59 (43.1)
Q3	D	Awareness and practices of respondents to have consultation from veterinary doctor about their pets	High	78 (56.9)
Q4				

\* respondents that have never purchased any of the items mentioned through an e-commerce platform were excluded from this section (n= 79).

### 4.2.2 Preferences of purchasing medicine, herbal preparation and health supplement of pets through e-commerce platform

A total of 64.6% (51 out of 79) of respondents have high preferences toward purchasing pet medicine, health supplement and herbal preparation via the online platform.

#### **4.2.3 Awareness and practices of respondents to seek veterinarian consultation about matters pertaining to their pets**

A total of 43.1% of total respondents have high level of awareness and likeliness to seek veterinary consultation regarding their pets, compared to more than half of respondents (56.9%), that have low awareness to seek veterinary consultation for the same purpose.

#### **4.3 Association between dependent variables and other factors**

Univariable and multivariable model was constructed for the association between respondents' awareness to have consultation for their pets and socio-demographic factors, knowledge and attitude of general pet management, and knowledge of potential abuse/misuse of medicine, herbal supplement and health preparation purchased via online. Results from these analyses are presented below.

##### **4.3.1 Association of factors with the respondents' level of concern for their pets**

The results are summarized in Table 4.6. Univariable model for the association between the respondents' socio-demographic factors and concerns of respondents for their pets result in significant association for gender ( $p=0.106$ ), awareness of the difference between branded and generic health products ( $p=0.012$ ), awareness of risk of harmful effects if health products are not used correctly ( $p=0.001$ ), awareness of potential health risk



	Yes	Maybe	How likely continue purchase online	Yes	No
	0.020			0.005	
	1.219	Ref		1.58	Ref
	9.949			1.15-2.1	
	0.237			0.017	
	2.034			1.52	
	0.627- 6.596			1.07- 2.17	

#### 4.3.2 Association of factors with the respondents' preferences of purchasing medicine, herbal preparation and health supplement of pets through e-commerce platform

In this particular section, respondents who had never purchased medicine, herbal preparations or health supplement for their pet via e-commerce platforms were excluded from further analysis. This exclusion aimed to evaluate pet owners' preferences for purchasing these items through e-commerce. The total number of respondents that included in this logistic regression analysis was 79.

A sole significant association has been identified. Respondents expressing a willingness to persist in acquiring medicine, herbal preparations, or health supplements for their pets through online platforms, despite acknowledged risks, exhibit a positive and noteworthy correlation with their inclination to purchase these items via e-commerce (Odds Ratio = 2.092, 95% Confidence Interval: 1.325, 3.301,  $p < 0.05$ ).

**Table 4.7: Univariable model for the factors associated with respondents' preferences for online purchasing of pets' medicine, herbal preparation and health supplement**

	<b>Sig.</b>	<b>OR</b>	<b>95% CI</b>
How likely to continue purchase online	0.002	2.092	1.325-3.301

#### **4.3.3 Association of factors with the respondents' awareness and practices to have consultation from veterinary doctor about their pets**

For socio-demographic factors, the significant factors at univariable level were gender ( $p= 0.010$ ), age group ( $p= 0.089$ ), range of household ( $p = 0.037$ ) and income per household ( $p=0.012$ ).

For knowledge of potential abuse/misuse of medicine, herbal supplement and health preparation purchased via online, the significant factors at univariable level were awareness of different between branded and generic health products ( $p=0.000$ ), awareness of potential health risk of health products purchased via online ( $p=0.009$ ), the likeliness to continue purchase pet healthcare products online despite risks ( $p=0.027$ ), and opinion toward online platform ( $p=0.065$ ).

In the context of multivariable logistic regression analysis, it was observed that males exhibited a lower awareness of the necessity for veterinarian consultations for their pets compared to females ( $OR=0.413$ ,  $95\% CI 0.158-1.079$ ). Conversely, individuals with a heightened awareness of the distinctions between branded and generic healthcare products were more inclined to seek veterinarian consultations for their pets ( $OR=2.292$ ,  $CI: 1.286-4.086$ ). A similar positive association was noted for those aware of the

potential side effects of incorrectly used pet healthcare products, as they demonstrated an increased likelihood of seeking veterinarian consultations for their pets (OR=1.932, 95% CI: 1.093-3.413). Lastly, respondents harbouring a negative perception toward the online purchase of medicine, herbal preparations, and health supplements exhibited a reduced propensity for veterinarian consultations for their pets compared to those with no opinion (OR=0.617, 95% CI: 0.059-6.442).

**Table 4.8: Logistic regression models for the factors associated with respondents' awareness to have veterinary consultation regarding their pets**

Gender	Univariable model		Multivariable model				
	P-value	OR	P-value	OR	95% CI		
Male	0.010	0.398	0.071	0.413	0.239-15.052	0.457-66.275	0.257-41.131
Female		Ref		Ref			
Age group	0.089	2.098	0.434	1.897	0.364-12.076	0.971-45.793	0.480-21.997
18-29	0.407	6.667	0.545	5.502			
30-39	0.054	3.250	0.179	3.251			
40-49	0.227	Ref	0.363	Ref			
50+							
Range of household old	0.073		0.217				



0.059- 6.442	0.617 Ref	0.687	0.244- 5.700	1.179 Ref	0.838	Negative No opinion
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#### 4.4 Correlation between level of concerns of pet owners, preferences of purchasing pet healthcare product online, and awareness to have veterinary consultation

There is significant positive correlation ( $r= 0.520$ ,  $p= 0.000$ ) between the pet owners' concern and their awareness of the need for veterinary consultation for their pets (Table 4.9).

**Table 4.9: Correlation between the three research outcomes investigated in the survey**

		Level of concerns of pet owners	Preferences of purchasing pet healthcare product online	Awareness to have veterinary consultation
Level of concerns of pet owners	Pearson correlation	1	0.143	0.520
	P-value		0.209	0.01
Preferences of purchasing pet healthcare product online	Pearson correlation	0.143	1	0.107
	P-value	0.209		0.349
Awareness to have veterinary consultation	Pearson correlation	0.520	0.107	1
	P-value	0.01	0.349	

## CHAPTER 5

### DISCUSSION

#### **5.1 Association of factors with the respondents' level of concern for their pets.**

Approximately 65.7% of the 137 respondents exhibited notable concern for the overall well-being of their pets. Primary priorities included wellness (94.9%) and health (94.8%), followed closely by hygiene and comfort (both at 94.2%). The relationship between respondents' expressions of concern for their pets' well-being and various socio-demographic factors was further examined. In a univariate analysis, it was found that males exhibited less concern for their pets (OR = 0.555; CI: 0.271-1.134;  $p = 0.106$ ). This finding aligns with Herzog (2007) and Apostol (2013), who reported that women generally exhibit more positive attitudes towards animals, express greater concern for animal welfare, and are more actively involved in animal welfare issues than men.

In a multivariable model, it was observed that respondents who indicated their likeliness to continue purchasing animal health products online were more prone to having heightened concerns for their pets' well-being (OR = 1.52; 95% CI: 1.07–2.17;  $p = 0.017$ ) compared to those not interested in continuing online purchases. This aligns with Pacelli et al. (2022) findings that pet owners are more willing to allocate funds for their dogs than for themselves. Additionally, Shaw et al. (2022) suggested that the public's online purchasing habits, fostered by positive experiences during the pandemic lockdown and perceived utility and security of online platforms, are expected to persist post-pandemic. Consequently, the likelihood of concerned pet owners continuing to make online purchases, as indicated in

the present study, may be associated with their willingness to invest in their pets and their sustained online purchasing habits beyond the pandemic.

## **5.2 Association of factors with the respondents' preferences of purchasing medicine, herbal preparation and health supplement of pets through e-commerce platform**

In our dataset, female respondents outnumbered males by 58.4%. Despite this gender imbalance, gender did not play a significant role in influencing the preference for online purchases of animal health products ( $p = 0.428$ ). This finding is in contrast to Melović et al. (2021) whereby males tend to favour online shopping. However, it's crucial to note that Melović et al. (2021) observation focused on online purchases of general items and may not accurately represent the trend observed in the specific community or location sampled in our study.

Although respondents from Generation Z (18–29 years old) outnumbered those from other age groups (Gen Y, Gen X, and Baby Boomers II), age did not emerge as a significant factor influencing the preference for online shopping of pet healthcare products ( $p = 0.647$ ). This finding contrasts with Koch et al. (2020) who reported that Generation Z consumers displayed higher motivation for online shopping compared to Generation Y consumers. The discrepancy might be attributed to perceived risks associated with online purchases, such as after-sales risk and financial risk, as well as psychological and technical barriers identified in previous studies (Nawi et al., 2019; Melović et al., 2021). However, Generation Y, with increased internet access and technological proficiency, seemed more adept at recognizing the benefits of online purchases.

We explored ethnicity, household size, education level, and income level as potential influencers of online purchasing decisions. While ethnicity did not significantly impact the preference for online shopping of animal health products ( $p = 0.792$ ), household size was similarly inconclusive ( $p = 0.660$ ). Contrary to findings by Miles (2001) and Roy (1994), who reported that consumers from larger households tend to make more online purchases, our study did not observe a significant correlation between household size and the inclination for online shopping of animal health products.

Despite a majority of respondents having tertiary education and falling into the M40 and B40 income levels, these factors did not prove significant in influencing overall online buying decisions for animal health items ( $p > 0.1$ ). This contrasts with the general notion that education and income levels impact online buying decisions (Farhana et al., 2017; Punj, 2011). However, it's important to note that the prior studies were conducted on local consumers in countries with different cultures, technology landscapes, and per capita earnings.

A significant portion of respondents (72.2%) expressed a preference for purchasing animal health products based on promotions and discounts offered by e-commerce platforms, with product availability and a diverse range of options (70.9%) also being significant factors. These findings align with Jadhav and Khanna (2016), emphasizing the role of promotions, competitive prices, product availability, variety, good customer service, and user-friendly platforms in consumers' decision-making processes for online purchases.

The majority of respondents expressed confidence in the safety (82.3%) and authenticity and quality (59.5%) of animal health products sold online. Nonetheless, the absence of appropriate oversight due to reduced interaction between professionals and internet users through online shopping may pose a potential threat to animal health (Fittler et al., 2018). This underscores the importance of addressing the potential risks associated with online purchases, such as self-diagnosis, overlapping therapies, adverse effects, antimicrobial resistance, toxicity, and potential harm to animals.

Approximately 52.6% of respondents held mixed opinions and were cautious about using e-commerce to acquire healthcare products for their pets. This caution was observed despite respondents being aware of the differences between branded and generic health products ( $p = 0.000$ ) and the potential health risks associated with online purchases ( $p = 0.009$ ). Surprisingly, 59.1 percent of these cautious respondents expressed a willingness to continue purchasing medicine online despite recognizing the risks ( $p = 0.027$ ). This could be attributed to positive experiences with previous purchases or a lack of harmful effects observed in their pets, as reported by 83.2% of respondents.

Recent reports indicated that over 90% of prescription medicines for humans on e-commerce platforms in Malaysia were not registered under the Drug Control Authority (Alphonsoes et al., 2021). While the registration status of animal health products on these platforms is not available presently, the potential risks associated with unknown quality, efficacy, and authenticity of drugs pose a concern. The detection of counterfeit and fake medicines sold online needs to be prioritized to safeguard the interests of online users and

the welfare of pets, especially given the anticipated increase in online purchases of animal health products in the future (Gelder, 2023).

### **5.3 Association of factors with the respondents' awareness and practices to have consultation from veterinary doctor about their pets**

As shown in Table 4.4, a substantial majority of respondents (75.9%) demonstrated awareness of the disparities in quality and safety standards between branded and generic medicine, herbal preparations, or health supplements for pets. However, the prevalence of unregistered medicines, herbal preparations, and health supplements available on online platforms poses a considerable threat to animal health, lacking the required clinical trials and quality assurance mandated by regulatory authorities. The Registration Guideline for Veterinary Products (REGOVP) version 3 (2020) by the National Pharmaceutical Regulatory Division, Ministry of Health (MoH), mandates rigorous processes, including quality control, inspection, and licensing, ensuring the efficacy and safety of drugs intended for use in animals.

In the multivariable model, respondents aware of the distinctions between generic and branded animal health products (OR = 2.292; 95% CI: 1.286-4.086;  $p < 0.005$ ) and cognizant of the potential harmful effects of incorrect use of OTC animal health products on pets (OR = 1.932; 95% CI: 1.093-3.413;  $p < 0.023$ ) were more likely to demonstrate awareness and engage in consultation with a veterinarian regarding their pets. These findings align with expectations, as informed pet owners generally exhibit positive attitudes and adhere to good practices in managing their pets. However, Debbra et al. (2019) reported that about half of pet owners in Putrajaya had never brought

their pets to veterinary clinics, emphasizing that the collective purchasing behaviour of these pet owners cannot be conclusively postulated.

Financial constraints significantly hinder access to proper veterinary care, particularly for low-income individuals with pets (Wiltzius et al., 2018). The present study revealed that mid-income (M40) respondents with professional careers were more likely to seek veterinary consultation compared to other income categories. Although income level did not emerge as a significant factor in the logistic regression model for respondents' awareness of seeking veterinary consultation, the role of income in limiting access to proper veterinary care needs attention. Additionally, other factors such as operating hours, commute length to the veterinarian's office, geographical location, transportation facilities for pets, veterinarian-client communication, and cultural/language barriers affecting access to proper veterinary care and consultation require further exploration (Lem et al., 2016; LaVallee et al., 2017; Wiltzius et al., 2018).

There's a prevailing assumption that a community comprising educated individuals with high purchasing power is more inclined to purchase goods and services through online platforms, relying on internet-based information rather than face-to-face consultations with veterinary personnel. Gates et al. (2019) reported that 50.8% of pet owners used the internet as a source of information for pet-related problems. While seeking information online can be beneficial, relying solely on internet sources, especially for animal diagnoses, poses risks to pets. Seeking expert advice regarding pets' health is crucial, particularly for sick animals, as it directly impacts their quality of life and mental well-being, thus fulfilling the five elements of animal freedom, which

include freedom from pain, injury, and disease as essential needs for every animal (Webster, 2016).

#### **5.4 Correlation between the levels of concern of pet owners, preferences of purchasing pet healthcare product via online, and awareness to have veterinary consultation**

The results of Pearson's correlation analysis revealed a positive correlation ( $r = 0.520$ ,  $p = 0.01$ ) between pet owners' awareness of seeking veterinary consultation for their pets and their level of concern. This aligns with findings from Lai et al. (2021), who observed that pet owners with heightened concern are more likely to independently search for pet health information online and discuss the results with veterinarians, both before and during consultations or visits. Additionally, pet owners who were actively involved in shared decision-making (SDM) with veterinarians during consultations tend to derive greater satisfaction from the experience (Ito et al., 2022). As a result, well-informed and concerned owners exhibit a tendency to seek veterinary consultations before making online purchases of animal health products.

However, the correlation between respondents' preferences for online purchases and their level of concern ( $r = 0.143$ ,  $p = 0.209$ ), as well as the correlation between respondents' preferences for online purchases and their awareness of the importance of seeking veterinary consultation prior to making purchases ( $r = 0.107$ ,  $p = 0.349$ ), were not found to be statistically significant. Considering these findings collectively, it becomes imperative to delve deeper into the actual factors contributing to the disparities observed in the study results and the underlying reasons influencing the inclination to

visit veterinarians for consultation. Further investigation is warranted to gain a comprehensive understanding of these dynamics.



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## CHAPTER 6

### CONCLUSION

Pet owners express significant concern for their pets' well-being, with female owners displaying heightened levels of concern. Factors such as age, household size, and income play a role in influencing the likelihood of seeking veterinary consultation before purchasing animal health products. However, these factors do not have a significant impact on their preference for online shopping. Nevertheless, individuals who are knowledgeable about the distinctions between generic and branded animal health products, as well as the potential harmful effects of incorrect usage, are more inclined to seek consultations with a veterinarian. Additionally, those who favour online shopping for animal health products are likely to continue this behaviour. To address the prevalence of unregistered products and enhance awareness, targeted campaigns and interventions are necessary. Further research is essential to uncover and understand the barriers to proper veterinary care and consultation.

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**Appendix**



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**ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS  
(JKEUPM)  
UNIVERSITI PUTRA MALAYSIA**

<b>Research title</b>	: <b>Purchasing Behaviour of Medicine, Herbal Preparations and Health Supplements For Animals Through the E-Commerce Platform by Pet Owners In the Klang Valley.</b>
<b>Study Site</b>	: <b>Klang Valley</b>
<b>JKEUPM Ref No.</b>	: <b>JKEUPM-2023-464</b>
<b>Principal Investigator</b>	: <b>Dr. Wan Mastura Shaik Mohamed Mossadeq</b>
<b>Co-investigator</b>	: <b>Muhammad Nur Ikhwan Bin Asha (Student)</b>

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 15/05/2023.
2. Respondent's Information Sheet / Consent (English), Version 1 dated 15/05/2023.
3. Proposal (English), Version 2 dated 05/07/2023.
4. Questionnaire / Interviews (English), Version 1 dated 15/05/2023.
5. Curriculum Vitae of:
  - a. Dr. Wan Mastura Shaik Mohamed Mossadeq

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.

Decision by JKEUPM:

- Approved
- Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**
- Disapproved

Please note that the approval is **VALID UNTIL 5 AUGUST 2024**

Researchers should comply with the following:

- I. Complete a Study Final Report upon study completion (Form 3.2).
- II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.
- III. Applicable for Clinical Trial Studies and Clinical interventional Studies only: Progress Report has to be submitted to JKEUPM at every 6 months from the date of approval (Form 3.1). Report occurrences of all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs) and Protocol Deviation/ Violation at all JKEUPM approved sites to JKEUPM. All serious adverse events (SAEs) detected or being notified should be reported immediately to the sponsor except for those SAEs that the protocol or other document (e.g.,

