



UNIVERSITI PUTRA MALAYSIA

**CAT OWNERS'S PERCEPTION TOWARDS FELINE CHRONIC
KIDNEY DISEASE: A BEHAVIOURAL STUDY**

CHOONG CHUN HOONG

**Ip
FPV 2021 10**

**CAT OWNERS 'S PERCEPTION TOWARDS FELINE CHRONIC
KIDNEY DISEASE: A BEHAVIOURAL STUDY**

CHOONG CHUN HOONG

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
Serdang, Selangor Darul Ehsan.

DECEMBER 2021

DEDICATION

I would love to express my greatest gratitude to my supervisor Dr. Khor Kuan Hua,
co-supervisor Dr. Khor Kuan Siew and Dr Norhidayah Noordin
who have been a constant source of support and guidance.

To my family whose affection, love, encouragement, and prayers

that make me able to get such success

Along with all diligent and respected lecturers

ACKNOWLEDGEMENT

It has been a great learning experience for me when carrying out this research. I would like to thank the people who have supported and assisted me so much during the process.

First and foremost, I would like to express my heartfelt appreciation to my supervisor Dr. Khor Kuan Hua for her patience, knowledge, and her precious time in guiding me which helped me to complete this research. Her unconditional supervision and thoughtful comments had helped me during my research and writing of this thesis. I could not have imagined having a better supervisor and mentor for my research project.

Besides, I am sincerely grateful to be co-supervised by Dr. Khor Kuan Siew who has taught me about statistical analysis which are crucial in interpreting data for my research project. I am tremendously thankful for her spending her precious time in teaching me. I would also like to thank Dr. Norhidayah Noordin for her advice and teaching on a theory important for my research as well as in data analysis.

Last but not least, a wholehearted thanks to my family and friends: my beloved parents for supporting me spiritually throughout my studies.

CONTENTS

	Page
TITLE	i
CERTIFICATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
CONTENTS	v
LIST OF ABBREVIATIONS	viii
LIST OF TABLES	ix
LIST OF APPENDIX	xii
ABSTRAK	xiii
ABSTRACT	xv
 1.0 INTRODUCTION	
1.1 INTRODUCTION.....	1
1.2 OBJECTIVES.....	3
1.3 HYPOTHESES.....	4
 2.0 LITERATURE REVIEW	
2.1 FELINE CKD.....	6
2.2 TREATMENT AND MANAGEMENT OF FELINE CKD.....	7
2.3 AWARENESS OF FELINE CKD.....	9

2.4	CHALLENGES IN TREATMENT OF FELINE CKD.....	10
2.4.1	COST.....	10
2.4.2	TIME.....	11
2.4.3	SURVIVABILITY OF CATS WITH CKD.....	11
2.5	THEORY OF PLANNED BEHAVIOUR.....	12
2.5.1	INTENTION TO TREAT.....	13
2.5.2	ATTITUDE.....	13
2.5.3	SUBJECTIVE NORM.....	14
2.5.4	PERCEIVED BEHAVIOURAL CONTROL.....	14
2.5.5	AFFECTIVE INFLUENCE ON ATTITUDE.....	15
3.0 MATERIALS AND METHODS		
3.1	RESEARCH DESIGN.....	17
3.2	QUESTIONNAIRE DESIGN.....	17
3.3	SAMPLING METHOD AND DATA COLLECTION.....	19
3.4	DATA ANALYSIS METHOD.....	20
4.0 RESULTS		
4.1	DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS.....	21
4.2	CAT OWNERSHIP INFORMATION.....	24
4.3	CAT OWNERS' AWARENESS AND THEIR BARRIER TO TREAT CKD.....	26
4.4	INTENTION TO TREAT CATS WITH CKD.....	29
4.4.1	ASSESSMENT OF MEASUREMENT MODEL.....	29

4.4.2	ASSESSMENT OF STRUCTURAL MODEL.....	32
4.4.3	SUMMARY OF HYPOTHESES TESTING.....	34
5.0	DISCUSSION.....	35
6.0	CONCLUSION AND RECOMMENDATIONS.....	42
7.0	REFERENCE.....	44
8.0	APPENDIX.....	54



LIST OF ABBREVIATIONS

AR	Anticipated regret
ATT	Attitude
AVE	Average variance extracted
AVMA	American Veterinary Medical Association
CR	Composite reliability
EC	Empathic concern
GFR	Glomerular filtration rate
INT	Intention to treat
IRIS	International Renal Interest Society
PBC	Perceived behavioural control
QoL	Quality of life
SDMA	Symmetric dimethylarginine
SN	Subjective norm
TPB	Theory of Planned Behaviour
USA	United States of America
UVH-UPM	University Veterinary Hospital-University Putra Malaysia
VIF	Variance inflation factor

LIST OF TABLES

Tables	Title	Page
Table 1:	The percentage distribution of the respondents' state (n=297)	21
Table 2:	The percentage distribution of respondents' gender (n=300)	22
Table 3:	The percentage distribution of respondents' age (n=300)	22
Table 4:	The percentage distribution of respondents based on monthly household income (n=297)	23
Table 5:	The percentage distribution of respondents' level of education (n=300)	23
Table 6:	The percentage distribution of respondents' employment status (n=289)	24
Table 7:	The percentage distribution of respondents' on number of cats owned in household (n=300)	24
Table 8:	The percentage distribution of respondents' years of experience in caring for cats (n=298)	25
Table 9:	The percentage distribution of respondents' with cats with chronic illnesses (n=300)	25

Tables	Title	Page
Table 10:	The percentage distribution of respondents' with experience in handling cats with kidney-related issues (n=300)	25
Table 11:	The percentage distribution of respondents' purpose of having cats in household	26
Table 12:	The percentage distribution of respondents' awareness on cats' susceptibility to CKD (n=300)	26
Table 13:	The percentage distribution of respondents' sources of information	27
Table 14:	The percentage distribution of the respondents' willingness to treat (n=300)	28
Table 15:	The percentage distribution of respondents' opinion on barriers that challenge CKD treatment	28
Table 16:	The percentage distribution of respondents' with reluctance cats to pilling (n=297)	29
Table 17:	The percentage distribution of respondents' ability to pill their cats (n=297)	29

Tables	Title	Page
Table 18:	Convergent validity of constructs	31
Table 19:	Discriminant validity of constructs	32
Table 20:	Path coefficients and hypotheses testing	33
Table 21:	Summary of hypotheses test results	34

LIST OF APPENDIX

APPENDIX	Title	Page
APPENDIX I:	Questionnaire on Cat Owner's Perception towards Feline Chronic Kidney Disease	



ABSTRAK

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

PERSEPSI PEMILIK KUCING TERHADAP PENYAKIT GINJAL KRONIK

KUCING: KAJIAN TINGKAH LAKU

Oleh

Choong Chun Hoong

2021

Penyelia: Dr. Khor Kuan Hua

Penyelia Bersama: Dr. Khor Kuan Siew

Penyakit ginjal kronik ialah penyakit progresif yang tidak dapat diubati. Penyakit ini biasanya didiagnosis di kucing geriatrik dan memerlukan rawatan jangka panjang. Kualiti hidup dalam kalangan kucing yang didiagnosis dengan penyakit kronik ginjal selalunya bergantung pada permatuhan pemiliknya terhadap rawatan and pengurusan. Dalam kajian ini, tinjauan kuantitatif telah dijalankan untuk menentukan kesedaran pemilik kucing terhadap penyakit ginjal kronik, mengenal pasti halangan yang dialami oleh pemilik kucing dalam mendapatkan rawatan serta menyiasat faktor-faktor yang mempengaruhi niat pemilik kucing untuk merawat kucing mereka jika didiagnosis dengan penyakit ginjal kronik. Berdasarkan *Theory of Planned Behaviour*, sebuah soal selidik telah dijanakan dan diedarkan melalui pendekatan pensampelan

mudah seperti platform media sosial dan menghantar jemputan melalui e-mel kepada pemilik kucing. Sejumlah 300 responden telah menyertai tinjauan ini dan data menunjukkan bahawa majoriti responden (86.3%) sedar bahawa kucing boleh terdedah kepada penyakit ginjal kronik dan halangan utama dalam mendapatkan rawatan adalah kos (70.4%) disebabkan oleh rawatan jangka panjang mengikuti keperluan pesakit kucing. Ketiga-tiga faktor utama iaitu sikap ($\beta=0.379$, $p<0.01$), norma subjektif, ($\beta=0.147$, $p<0.05$) dan tanggapan kawalan tingkah laku ($\beta=0.348$, $p<0.01$) adalah peramal yang signifikan terhadap niat untuk merawat kucing dengan penyakit ginjal kronik. Di samping itu, analisis menunjukkan bahawa jangkaan penyesalan ($\beta=0.522$, $p<0.01$) dan perhatian empati ($\beta=0.125$, $p<0.05$) mempengaruhi sikap pemilik kucing terhadap rawatan. Kajian ini juga mengenal pasti bahawa doktor haiwan memainkan peranan yang penting kerana 98% responden bersetuju bahawa persetujuan dari doktor haiwan adalah penting semasa mendapatkan rawatan untuk kucing mereka. Oleh itu, komunikasi yang cekap antara doktor haiwan dan pemilik kucing akan memberikan sokongan motivasi kepada niat pemilik kucing untuk merawat kucing mereka. Hal ini akan meningkatkan kualiti hidup kucing yang menghidapi penyakit ginjal kronik.

Kata kunci: penyakit ginjal kronik; Theory of Planned Behaviour; kesedaran; halangan; sikap

ABSTRACT

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

CAT OWNERS' PERCEPTION TOWARDS FELINE CHRONIC KIDNEY DISEASE: A BEHAVIOURAL STUDY

By

Choong Chun Hoong

2021

Supervisor: Dr. Khor Kuan Hua

Co-Supervisor: Dr. Khor Kuan Siew

Chronic kidney disease (CKD) is an incurable progressive disease commonly diagnosed in geriatric cats and requires long-term medical attention. The quality of life among cats succumbed to chronic illness often relies in their owner's compliance with treatment and management. In this study, a quantitative survey was conducted to determine the awareness of cat owners towards CKD, to identify barriers experienced by cat owners in seeking treatment and to investigate the predictors that influence cat owners' intention to treat if their cats diagnosed with CKD. Based on the theory of planned behaviour, an online questionnaire was generated and distributed via convenience sampling approach such as using social media platforms

and sending invitations via e-mail to cat owners. A total of 300 respondents are recruited and the data revealed that majority of the respondents (86.3%) are aware that cat is susceptible to CKD and the main barrier in seeking treatment for CKD was cost-related (70.4%) due to the long-term management as required by the cat patients. All three major factors namely attitude ($\beta=0.379$, $p<0.01$), subjective norms, ($\beta=0.147$, $p<0.05$) and perceived behavioural control ($\beta=0.348$, $p<0.01$) of the cat owners are significant predictors towards intention to treat cats with CKD. Additionally, the results showed that anticipated regret ($\beta=0.522$, $p<0.01$) and empathic concern ($\beta=0.125$, $p<0.05$) positively influence cat owners attitude towards treatment. This study also identified that veterinarian plays an important role as 98% of the respondents agreed that approval from veterinarian is important when seeking treatment for their cats and therefore, improved veterinarian-client communication would provide a better motivational support towards intention to treat with the ultimate aim to improved quality of life in affected cats.

Keywords: Chronic Kidney Disease; Theory of Planned Behaviour; awareness; barriers; attitude

CHAPTER 1.0

INTRODUCTION

1.1 INTRODUCTION

Feline chronic kidney disease (CKD) is an incurable progressive disease which is commonly diagnosed in geriatric cats and routinely needed medical attention (Sent *et al.*, 2015). In recent years, an increasing trend was seen in cats being diagnosed with CKD (Brown *et al.*, 2016). This observation is consistent with the database shown in Purdue Veterinary where 16 cases/1000 cats diagnosed with CKD in 2000 (Brown *et al.*, 2016) has increased to 96 cases/1000 cats diagnosed with CKD in 2000. In the United Kingdom, about 1.7% to 3.6% of cats presented at the primary care practice were reported diagnosed with CKD (O'Neill *et al.*, 2014). However, a greater incidence of CKD was seen with geriatric cat as the age increased. According to Marino (2013), 17 out of 21 (81.0%) geriatric cats aged 15-20 years old had CKD were highest in numbers when compared among age groups.

Despite the rising prevalence of CKD in cats, an awareness study carried out in Taiwan revealed that 9 out of 10 cat owners are not aware of CKD in cats (Taipei Times, 2020) which prompts us to think if the condition was similar in Malaysia. Similarly in Malaysia, cats were not spared from CKD and there was marked increased in the number of CKD cases presented to University Veterinary Hospital of University Putra Malaysia (UVH-UPM) (Lim *et al.*, 2012). The alarming increased trend of CKD cases among pet cats prompted further investigation to determine the level of awareness in cat owners towards CKD in Malaysia. Understanding the level of awareness among cat owners towards CKD may allow a further appropriate action or

strategies to educate cat owners. For example, if the cat owners in Malaysia have low awareness towards CKD, awareness campaigns, programs or talks can be done to increase their awareness. It is believed that with improved level of awareness among cat owners towards CKD, it can help prevent CKD, allow early detection and delay disease progression and consequences (Plantinga *et al.*, 2010).

Although awareness towards CKD among cat owners plays an important role in control and prevention of CKD, there may be other barriers that prevent cat owners from treating or supporting their cats which requires life-long therapy. Reynolds (2010) observed that cat owners were reluctant to seek medical attention for their pet cats with heart disease and their concerns were related to stress that arise from frequent visitation to veterinary clinic and long-term treatment which may impair their cats' quality of life (QoL). This situation could be similar with cats with CKD due to the nature of the disease which requires constant monitoring and long-term medication. Assuming that cat owners understand the bad consequences of CKD if not treated in humans, they might be able to relate to their cats and realize the importance of treatment if their cats were diagnosed with CKD. In any long-term treatment, there are barriers that may prevent cat owners from treating or be compliance supporting their cats such as cost, time and nursing skills such as pilling oral medication, force feeding, and the ability to support fluid therapy.

Theory of planned behaviour (TPB) is a social cognitive model which is proposed by Icek Ajzen to understand human behaviour. This theory hypothesized that behavioural intention is determined by attitude, subjective norm, and perceived behavioural control (Ajzen, 1991). Generally, a positive attitude with a favourable

subjective norm and high degree of control over the behaviour will result in strong behavioural intention. In our study, we would like to determine cat owners' intention of treatment and we posited that intention to treat will result in cat owners actually treating their cat. Furthermore, affective components such as empathic concern and anticipated regret were incorporated in this study and designed as predictors of attitude towards intention to treat. Cat owners' attitude towards treatment might be improved if they have concerned and compassionate feelings for their CKD cats if not treated. Cat owners who are aware of the possible bad consequences from not treating their cat with CKD might anticipate regret of not treating their cat which makes them have a positive attitude towards intention to treat. This study claimed that empathic concern and anticipated regret would influence cat owners' attitude towards intention to treat. Hence, the identification of these factors will allow clinicians to formulate better strategy during consultation with clients. A strategized consultation will serve as motivation for clients to actually treat their cat with CKD. Ultimately, affected cats with CKD could have improved quality of life and longevity.

1.2 OBJECTIVES

The objectives of the study were

1. To determine the cat owners' awareness and barriers to treat CKD.
2. To examine the relationship between empathic concern and anticipated regret towards attitude to treat cats with CKD.
3. To examine the relationship between attitude, subjective norms, and perceived behavioural control towards intention to treat cats with CKD.

1.3 HYPOTHESES

The null hypotheses for this study were:

- H1_o. Cat owners' empathic concern does not positively affect their attitude towards intention to treat cats with CKD.
- H2_o. Cat owners' anticipated regret does not positively affect their attitude towards intention to treat cats with CKD.
- H3_o. Cat owners' attitude does not positively affect their intention to treat cats with CKD.
- H4_o. Cat owners' subjective norm does not positively affect their intention to treat cats with CKD.
- H5_o. Cat owners' perceived behavioural control does not positively affect their intention to treat cats with CKD.

The alternative hypotheses were:

- H1_a. Cat owners' empathic concern positively affects their attitude towards intention to treat cats with CKD.
- H2_a. Cat owners' anticipated regret positively affects their attitude towards intention to treat cats with CKD.
- H3_a. Cat owners' attitude positively affects their intention to treat cats with CKD.

H4_a. Cat owners' subjective norm positively affects their intention to treat cats with CKD.

H5_a. Cat owners' perceived behavioural control positively affects their intention to treat cats with CKD.



CHAPTER 2.0

LITERATURE REVIEW

2.1 FELINE CKD

Chronic kidney disease (CKD) refers to any kidney abnormalities that has been presented more than 3 months (Polzin, 2011). CKD is one of the commonly presented diseases especially older cats (Bartges, 2012). Although common, feline CKD remains as a poorly understood complex disease (Jepson, 2016). Reynolds (2013) classified feline CKD into two groups, namely congenital and acquired. Congenital disease such as polycystic kidney disease and renal amyloidosis have been reported and present in certain breeds with higher prevalence. As for acquired causes of CKD, it includes urolithiasis, renal lymphoma, hyperthyroidism, infections, nephrotoxic drugs, and many more (Reynolds, 2013).

Kidneys are important in filtration and excretion of waste materials (phosphorus and creatinine), endocrine function, metabolic regulation, and much more (Bartges, 2012). When there is reduction in renal function, a plethora of clinical signs can occur. Polyuria and polydipsia are the primary clinical signs that occur in the early stage of the disease (Bartges & Polzin, 2011). Polydipsia as a result of polyuria will be easily noticed by cat owners when they see their cats are drinking more water than usual (Reynolds & Lefebvre, 2013). When the disease advances, dehydration was often observed as sequelae when the kidneys are unable to retain water leading to polyuria (Bartges, 2012). As the renal function continues to deteriorate, uraemia may occur as a multisystemic clinical syndrome. The most common consequence of uraemia is gastrointestinal signs which includes decreased appetite and weight loss

(Bartges & Polzin, 2011). A study also reported that anorexia, weight loss, lethargy, and vomiting were the most common clinical signs presented in cats with CKD (Chen *et al.*, 2020). Others clinical signs related to reduced kidney function can also occur such as hypertension, anaemia, halitosis and many more.

Staging of CKD in cats plays important role in management of the disease and establishing prognosis. The International Renal Interest Society (IRIS) has proposed a 4-tier staging system based on the fasting level of serum creatinine and symmetric dimethylarginine (SDMA), then further substaging by the magnitude of proteinuria and hypertension (IRIS staging of CKD, 2019). According to an article of Clinician's Brief, stage 1 and 2 are considered to be early stages of CKD whereas stage 3 and 4 are the late stages of CKD (Dana, n.d.) and CKD management is different between early and late stages. Early stage CKD in cat has a relatively good prognosis if managed properly while late stage CKD will usually carry a poor prognosis. In a study investigating survival times of CKD cats, it was reported that the median survival times range from 103 to 1151 days according to IRIS stage (Boyd *et al.*, 2008).

2.2 TREATMENT AND MANAGEMENT OF FELINE CKD

Prior to the treatment and management of feline CKD, a thorough investigation is required to confirm the diagnosis and the kidney condition should be properly staged using the International Renal Interest Society (IRIS) staging system. Staging of CKD will allow prognosis to be made and most importantly, allows clinicians to establish suitable treatment plans based on the stage of CKD (Sparkes *et al.*, 2016). According to the IRIS staging system, CKD is classified into four stages based on findings of fasting blood creatinine or SDMA concentration in a well hydrated patient. Once a

stage had been identified, the disease is further substage based on the presence of proteinuria and hypertension.

In general, the long term management of CKD includes supportive and symptomatic therapy directed to correct derangements in fluid, electrolytes, acid base status, endocrine, and nutritional balance (Roudebush *et al.*, 2009) caused by reduced kidney function or damage. The ultimate aim of management in a cats with CKD is to improve the quality of life (QoL), especially those diagnosed in the end stage that can be challenging to manage and to slow down disease progression for cats with early stage of CKD (Sparkes *et al.*, 2016). However, due to the dynamic nature of CKD, continuous assessment of affected cats using the staging system is essential as objective assessment allows optimisation of the therapeutic management (Roudebush *et al.*, 2009).

Polzin (2010) stated that to ensure long term outcome in management of cat with CKD, a balanced diet specifically formulated to support the kidneys is crucial. It plays a vital role in minimizing adverse events such as uremic crisis and ultimately, to reduce mortality rate and improve longevity (Schaefer, 2021; Parker, 2021). Formulated renal diet has reduced concentration of phosphate, protein, and sodium with high fibre content, and several other supplements (Fritsch & Jewell, 2015). A diet with low phosphate is particularly important to prevent phosphate retention due to reduced kidney function that may enhance CKD progression resulting in adverse consequences (Polzin, 2010).

Maintaining hydration is of utmost importance in management of feline CKD. Cats with CKD have reduced kidney function with impaired glomerular filtration rate

(GFR) which could lead to azotaemia and uraemic crisis if not managed properly (Roudebush *et al.*, 2009). Furthermore, poorly hydrated cats will have impaired renal blood flow which could exacerbate kidney function resulting in metabolic derangements. Strategies to encourage voluntary fluid intake can be adopted by providing various water sources or wet food whereas subcutaneous fluid therapy should be reserved for late stage CKD (stage 3 and stage 4). (Sparkes *et al.*, 2016).

Syme (2002) reported that 19.4% of cats with CKD had hypertension. Antihypertensive medication may be needed for some affected cats to improve QoL and help with reducing proteinuria (Sparkes *et al.*, 2016). Several replacement therapies may also be needed for cats with CKD such as calcitriol therapy and erythropoietin therapy (Roudebush *et al.*, 2009) as the kidney plays an important role in synthesizing these two hormones.

In conclusion, management of CKD largely focuses on treating complications that arise due to reduced kidney function, managing comorbidities that accompany kidney disease, and slow down disease progression (Polzin, 2011).

2.3 AWARENESS OF FELINE CKD

Fuentes (2015) reported that a change in pet demographic was observed where the cats were favoured as pets and outnumbered the dogs. An article published in Budget Direct's website reported a high popularity of cats as compared to dogs as pets revealed from 91 countries. Similarly, the European Pet Food Industry reported that cats topped the list as pet among other species such as dog, birds, small mammals, aquaria, and reptiles. Consistently, studies have shown an increase in cats diagnosed with CKD, especially in recent decades (Brown *et al.*, 2016).

A meta-analysis done on human patient awareness of CKD revealed that the pooled CKD awareness was only 19.2% in 32 reports (Chu *et al.*, 2021). Therefore, it could be assumed that cat owners' awareness about CKD in cats could be poorer as the disease of interest is not about human but their pet cats.

Awareness toward CKD is important in the early course of disease in order for the implementation of evidence-based medical management (Plantiga *et al.*, 2010) to facilitate better long-term outcome. Hence, it is important to determine cat owners' awareness towards CKD and subsequently come out with appropriate action to improve awareness. A survey can be carried out to determine the level of awareness towards CKD and to understand them better which may eventually allow clinician to advocate early screening and treatment in cats affected with CKD.

2.4 CHALLENGES IN TREATMENT OF FELINE CKD

2.4.1 COST

The ultimate aim in management of CKD is to slow down the rate of deterioration and disease progression. Hence a suitable long term management may consist of a prescription diet suitable for kidney, medication, and supplements indefinitely. Furthermore, repeated subcutaneous fluid therapy every 1-3 days and blood transfusion may be needed for cats at the late stage of CKD (Sparkes *et al.*, 2016), hence increases the treatment cost with frequent hospital visits. Similarly, owners with cats diagnosed with heart disease claimed that cost was one of the top two challenges when seeking treatment (Khor, 2020) and unfortunately, it was related to the chronic nature of the disease. An article published by Embrace Pet Insurance revealed that the cost of managing a cat with CKD ranged from \$100-500 a month and

was dependent on the type of medications prescribed and how frequency fluid therapy was administered (Jacqueline, n.d.). Besides that, the long term provision of renal diet for the wellbeing of the kidneys is expensive when compared to the normal diet.

2.4.2 TIME

Regular monitoring and adherence to therapeutic interventions for cats with CKD heavily depends on the time that the owner can commit. Constant monitoring keeps track of the disease progression aimed to improve longevity. Hence to achieve this specifically, cats diagnosed with CKD may need frequent visitation to the clinic every 1-4 weeks for re-evaluation (Sparkes *et al.*, 2016). Whereas cats with stable clinical condition, re-evaluation should be done every 3-6 months (Sparkes *et al.*, 2016). Reynolds and Lefebvre (2013) reported that about 40-75% of cats with CKD experienced cachexia and weight loss. A reduction in appetite as a complication of CKD may occurred (Ross, 2016). To support and ensuring these cats getting its adequate nutrition and food, owners may need to coax feed their anorexic cats which requires patience and time. It was reported more than half of the cat owners may coax feed their cat 5-7 days per week and about one third of the cat owners feed their cat three times or more daily to address inappetence related with CKD (Markovich *et al.*, 2014). All these activities in terms of nursing care and monitoring would need owner attention, time and commitment. Time-related was a challenge among cat owners to support cat with progressive diseases (Khor, 2020).

2.4.3 SURVIVABILITY OF CATS WITH CKD

CKD arises when 75.0% or more of the kidney nephron is destroyed (Reynolds & Lefebvre, 2013). It is an irreversible progressive disease as the kidney is poor in

regenerating (Andrianova *et al.*, 2019). Hence, only therapeutic interventions may slow down the progression of the disease and prolong survival time for the affected cats with CKD. Boyd (2008) showed that cats with CKD stage II had a median survival time of 1151 days (95% CI: 1014-1565), 778 days (95% CI: 445-910) in stage III CKD, and 103 days (95% CI: 37-216 days) for stage IV CKD cats. This ultimately showed that survival time prolonged if supportive and symptomatic therapy can be provided (Sparkes *et al.*, 2016).

2.5 THEORY OF PLANNED BEHAVIOUR

The theory of planned behaviour (TPB) developed by Icek Ajzen (1991) attempted to predict human behaviour. The actual behaviour is co-determined by a person's intention to perform certain behaviour together with his or her perceived behavioural control (PBC). Intention, indicative of how hard someone is willing to try, is actually influenced by three independent determinants which are attitudes toward the behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991). Intention will likely translate into behaviour if an individual has positive attitudes toward the behaviour, approval from important referents, and access to resources and opportunities. In a meta-analysis of 185 independent studies by Armitage and Conner (2001), 27.0% and 39.0% of behaviour and intention were explained by using TPB. One study conducted by Khor (2020) reported the TPB accounted for 74.5% of the variance in intention to treat cats with heart disease. However, this theory has been criticised as it only focuses on rational interpretation of information without accounting for affective components which play a role in formation of behaviour (Sniehotta *et al.*, 2014). But, Ajzen (1991) described that the current TPB is open to

the incorporation of additional factors if that factor further explains behaviour and intention. In this study, affective components such as empathic concern and anticipated regret were incorporated into the model to be investigated.

2.5.1 INTENTION TO TREAT

Intention is the principal factor postulated in TPB (Ajzen, 1991) where the individual perceived the probability of performing a certain behaviour. Hence, the stronger the intention, the more likely that a behaviour will be performed. In TPB, attitude and subjective norm is hypothesized to be fully, and that of perceived behavioural control to be partially moderated by intention on behaviour (Sniehotta *et al.*, 2014). Based on the formulation of the theory, favourable attitude and supportive subjective norm motivate involvement in a behaviour but formation of strong intention would require a strong perceived control over the intention (Ajzen, 2020). In short, when all the components which include attitude, subjective norm, and perceived behavioural control are positive, an intention will likely be translated into behaviour.

2.5.2 ATTITUDE

According to the expectancy-value model of attitude by Fishbein and Ajzen (1975), formation of attitude depends on the people's belief where each belief connects the behaviour to a certain outcome. To explain in depth, attitude is an aggregation of beliefs that a certain behaviour will lead to certain outcomes following with evaluation of those outcomes (Matthew *et al.*, 2017). When the attitude towards certain behaviour is highly positive, it means the outcome of certain behaviour is highly likely as well as highly positive. This was reflected in a group of cat owners where their attitude positively affects the owner's intention to treat their cat with heart disease (Khor, 2020).

2.5.3 SUBJECTIVE NORM

Subjective norm is concerned with the approval or disapproval of an important individual or group towards a certain behaviour (Ajzen, 1991). It refers to an individual's decision to or to not perform (a behaviour) which is dependent on the opinion of someone important to that person about that certain behaviour. These important people could be anyone such as friends, family members and colleagues. Matthew (2017) explained that not all referents are similar in terms of their influence on someone to perform a certain behaviour which means an individual is more likely to comply with the most important person they deem. For example, family members' support was important to the cat owners when seeking treatment for their cat with heart disease as compared to other individuals such as peers and colleagues (Khor, 2020). However, several authors have opinions that the subjective norm is the weakest predictor of intention (Sheppard *et al.*, 1988; Van den Putte, 1991). One meta-analysis of TPB by Conner and Armitage (2001) reported weak prediction of subjective norm to intention.

2.5.4 PERCEIVED BEHAVIOURAL CONTROL

Perceived behavioural control refers to how a person perceives a certain behaviour in terms of easiness and difficulty in performing such behaviour (Ajzen, 1991). However, volitional control over behaviour varies across situations and addition of perceived behavioural control should improve prediction of certain behaviour with low volitional control (Ajzen, 1991). When a certain behaviour is not fully under volitional control, it is believed that the relationship between intention and behaviour is influenced by perceived behavioural control (Armitage & Conner, 2001).

In contrast, intention alone is sufficient to predict behaviour under conditions of high volitional control. Perceived behavioural control can influence action in two ways. First, it affects behaviour moderated by intention which means individuals with access to resources and opportunities are more likely to have high intention in performing certain behaviour. Secondly, PBC may influence behaviour directly when the perceived control mimics actual control (Kan & Fabrigar, 2017). This statement was supported by a meta-analysis carried out Armitage and Conner (2001) has claimed that perceived behavioural control affects behaviour directly. In general, if resources and opportunities are available to an individual as well as minimal obstacles that prevent performance of that behaviour, he or she should have greater perceived behavioural control (Kan & Fabrigar, 2017).

2.5.5 AFFECTIVE INFLUENCE ON ATTITUDE

Affective states that are commonly known are moods and emotions (Clore & Schnall, 2005). When a certain situation is perceived as negative or positive, emotions arise which then represented as feeling. Attitude formation resulted when the experience of such feeling conveys information that certain situation is good or bad (Clore & Schnall, 2005). From Bagozzi (1978) study, it was concluded that adding affective component in modelling attitude may be meaningful. In fact, several studies have incorporated specific emotions such as anger and fear which could play a role in determining attitude (Clore & Schnall, 2005). Hence, empathic concern and anticipated regret were incorporated as antecedents of attitude towards intention to treat in this study.

Empathic concern can be defined as compassionate emotions and concerned feelings felt for others when seeing someone in a needy situation (Wolfin, 2011). According to Batson (1991), empathic concern is believed to influence the occurrence of prosocial behaviour. In another study by Batson (1997), the role of empathy towards social stigmatized groups resulted in a positive attitude towards the whole group. Hence, it was hypothesized that cat owners' empathy concern arose when their pet cats were in a needy situation such as being diagnosed with CKD which influences their attitude towards intention to treat subsequently. In this study, empathic concern was designed as an antecedent of attitude towards intention to treat.

Regret is a negative emotion which people try hard to avoid (Janis & Mann, 1977). This negative emotion is experienced when we realize that the present condition could have been improved if we had chosen a better decision. According to Saffrey (2008), regret was the most valued feeling by people as compared to other emotions such as fear, shame, like, and guilt. Simonson (1992) discovered that regret can be anticipated prior to making a decision and hence preventing the possibility of experiencing such negative emotion. In fact, Falindah et al. (2013) highlighted the direct influence of regret on the attitude of individuals. In order to avoid this negative feeling, cat owners were assumed to have a more positive attitude towards intention to treat. Hence, anticipated regret was designed as a second antecedent of attitude towards intention to treat.

CHAPTER 3.0

MATERIALS AND METHODS

3.1 RESEARCH DESIGN

A descriptive design was used in this study to determine the awareness and perception of feline CKD among Malaysian cats' owners as predefined categories of respondents. The aim of this method was to define phenomena through description of association between variables. Descriptive research is pre-planned and organised so the data gathered can be statistically deduced on a population.

The research methodology adopted for this study was quantitative method to determine the relationship between the independent and dependent variables. In descriptive design, a questionnaire with two versions (English and Bahasa Malaysia) was used to collect data. A validation process was conducted prior to the actual conduct of the study to ensure that questions were easy to understand and all the items were validated with the Cronbach's Alpha of $>$ than 0.7.

3.2 QUESTIONNAIRE DESIGN

A questionnaire was developed for the use in this study. There are total 4 sections in the questionnaire. All the items in the questionnaire were being designed in a way for ease of understanding of each items and to increase compliance from the respondents.

The first section contained questions about demographic characteristics such as gender, age, monthly household income, level of education, and employment status.

The second section queried on the cat ownership information. Respondents were asked short answer questions about the number of cats they own and years of experience taking care of cats. Dichotomous and multichotomous closed-ended questions concerning whether they have cats with chronic illnesses, experience in handling cats with kidney-related issues, as well as the purpose of having cat in their household were also asked. The third section assessed cat owners on their awareness of feline CKD and challenges in managing cats with CKD. This section contained a mixture of multiple choice closed-ended questions such as whether they know both young and old cats can suffer from CKD, the means by which owners obtained their knowledge on susceptibility of cat to CKD, willingness to treat cat with CKD, and barriers that would be faced by the owners when seeking treatment. Besides that, this section also included questions about pet cat's compliance to pilling and owner's ability to give oral medication.

The last section was to assess the owners' intention to treat if their cat was diagnosed with CKD. TPB was adopted in this study. According to Icek Ajzen, TPB is a social cognitive model which hypothesizes that behavioural intention is influenced by three conceptually independent constructs which are attitude, subjective norm and perceived behavioural control. According to TPB, the more favourable the attitude and subjective norm, and the greater the perceived control, the stronger the owners' intention to treat their cat (Ajzen, 1991). Empathic concern and anticipated regret were designed as the predictors of attitude towards intention to treat. The respondents were prompted for subjective rating of their degree of agreement on each items under the constructs specified in the TPB: intention to treat (five items), perceived behavioural

control (six items), subjective norm (four items), attitude (five items), empathic concern (six items), and anticipated regret (four items). The items were posed to respondents using a 7-point Likert type scale from 1=strongly agree to 7=strongly disagree. A full illustration of the questionnaire is available in Appendix I.

3.3 SAMPLING METHOD AND DATA COLLECTION

Non-random sample selection method was used in this research in which the population was not given an equal probability to be selected. Convenience or accessibility sampling was used in this study by asking a cat owner who was most accessible to respond to a survey.

Study participants were cat owners obtained from social media such as Facebook, Instagram, and WhatsApp. The data was collected from between 5th September to 16th of January of 2017. Participants ($n=300$) were approached and given a standardised questionnaire. All responses were expected to be approximately 15 minutes and were conducted in either English or Malay depending on the respondent preference. Interviewer would assist in explaining and translating the terms or sentences that the respondents did not comprehend. In order to eliminate any potential bias, no specific selection was made in choosing respondents whose cats had heart disease and interviewer was not allowed to provide his own opinion to the respondent.

The respondents were required to answer a standardised owner's demographic section and cat ownership information section. The third section consisted of a series of questions related to the owner's awareness, challenges in managing feline CKD. In

the final section, the respondents were prompted for subjective rating of their degree of agreement on each item under the constructs specified in the TPB. Monitoring of respondents when answering the questionnaire was done to ensure accuracy of the data provided. The participants were assured and informed that their responses will be kept confidential and used for research purposes only.

3.4 DATA ANALYSIS METHOD

Microsoft excel and Webpower statistical power analysis were used for descriptive statistics and multivariate normality test on the demographic characteristics, cat ownership information, owners' awareness on feline CKD, and challenges in managing feline CKD. Data are presented as percentages. Besides that, the study applied variance-based structural equation modelling to test on the research hypotheses related to intention of cats' owners to treat their cats if they have been diagnosed with CKD is related to attitude, perceived behavioural control, and subjective norms by using the Smart PLS Version 3.3.3 software. According to the recommended two-stage analytical procedure, the measurement model which were validity and the reliability of measures were initially tested. Next, it was then followed by an examination of the structural model which was testing on the hypothesised association. A bootstrapping method (5000 resamples) was employed in order to check on the significance of the path coefficient and the loading.

CHAPTER 4.0

RESULTS

A total of 309 respondents were approached but the final usable data were 300 after data cleaning.

4.1 DEMOGRAPHIC CHARACTERISTIC OF RESPONDENTS

The respondents' state composition of the 297 participants in this survey where majority of the respondents came from three states namely Selangor (43.1%), Kuala Lumpur (13.8%), and Johor (10.1%). None of the respondents were from Terengganu and Labuan. The rest of respondents were from other states with their respective compositions ranging from 1.0% to 6.4% (refer Table 1).

Table 1: The percentage distribution of the respondents' state composition ($n=297$)

State	Frequency	Percentage (%)
Selangor	128	43.1
Kuala Lumpur	41	13.8
Johor	30	10.1
Perak	19	6.4
Penang	16	5.4
Negeri Sembilan	13	4.4
Melaka	12	4.0
Kedah	10	3.4
Pahang	8	2.7
Sarawak	5	1.7
Kelantan	4	1.3
Perlis	4	1.3
Putrajaya	4	1.3
Sabah	3	1.0
Terengganu	0	0
Labuan	0	0

Majority of the respondents' gender was female which comprised of 80.7% whereas male respondents only comprised of 19.3% (refer Table 2).

Table 2: The percentage distribution of respondents' gender ($n=300$)

Gender	Frequency	Percentage (%)
Male	58	19.3
Female	242	80.7

The largest representation of respondents based on age falls under the category from 20 to 29 years old (49.0%), followed by, from 30 to 39 years old (23.0%), 40 to 49 years old (13.7%) 50 years old or above (11.7%), and lastly, 19 years old or below (2.7%) (refer Table 3).

Table 3: The percentage distribution of respondents based on age ($n=300$)

Age	Frequency	Percentage (%)
19 or below	8	2.7
20-29 years	147	49.0
30-39 years	69	23.0
40-49 years	41	13.7
50 or above	35	11.7

Majority of the respondent's monthly household income level was between RM2,000-RM5,000 (29.0%), followed by RM5,001-RM10,000 (27.9%), below RM2,000 (21.2%), RM10,001-RM20,000 (14.1%) and lastly, more than RM20,000 (7.7%) (refer Table 4).

Table 4: The percentage distribution of respondents based on monthly household income ($n=297$)

Monthly household income	Frequency	Percentage (%)
less than RM2,000	63	21.2
RM2,000-RM5,000	86	29.0
RM5,001-RM10,000	83	27.9
RM10,001-RM20,000	42	14.1
More than RM20,000	23	7.7

Majority of the respondents held a first degree or diploma comprised of 66.3%, master degree or PhD holders came next with 19.3% followed by secondary school qualification with 14.0%, and lastly respondents with primary school qualification accounted for 0.3% (refer Table 5).

Table 5: The percentage distribution of respondents based on level of education ($n=300$)

Level of education	Frequency	Percentage (%)
None	0	0
Primary school	1	0.3
Secondary school	42	14.0
First Degree or Diploma	199	66.3
Master Degree or PhD	58	19.3

Majority of the respondents were employed which classified into life science sector (30.1%), social science sector (29.4%), and 12.9% of the respondents were self-employed. About one fourth of the respondents were not working or studying at the moment. No respondent chose other for this question (refer Table 6).

Table 6: The percentage distribution of respondents' employment status ($n=289$)

Employment status	Frequency	Percentage (%)
Not working or studying at the moment	74	25.6
Self employed	43	14.9
Life sciences	87	30.1
Social sciences	85	29.4
Other	0	0

4.2 CAT OWNERSHIP INFORMATION

More than three quarter of the respondents owned 1-5 cats (77.3%), 13.3% of the respondents owned 6-10 cats, followed by 5.3% respondents who owned 11-15 cats. Lastly, there were 12 respondents (4.0%) who owned more than 15 cats (refer Table 7).

Table 7: The percentage distribution of number of cats owned by respondents ($n=300$)

Number of cats owned	Frequency	Percentage (%)
1-5 cats	232	77.3
6 - 10 cats	40	13.3
11 - 15 cats	16	5.3
more than 15 cats	12	4.0

Of the total 298 respondents, almost half of the respondents (41.6%) 1-5 years of experience in taking care of cats, followed by 23.2% of the respondents had 6 to 10 years, 20.1% had more than 15 years of experience, 11.7% had 11-15 years of experience and lastly, only 3.4% of the respondents had less than 1 year of experience in having cats as pet (refer to Table 8).

Table 8: The percentage distribution of respondents' number of years of experience in taking care of cats ($n=298$)

Number of years	Frequency	Percentage (%)
less than 1 year	10	3.4
1-5 years	124	41.6
6-10 years	69	23.2
11-15 years	35	11.7
more than 15 years	60	20.1

Among the respondents who participated in this survey, about one fourth of them had cat with chronic illness whereas 74.3% of the respondents did not have cat with chronic illness. Among the reported long term illnesses, urinary problem, CKD, and heart problem top the list (refer to Table 9).

Table 9: The percentage distribution of respondents with cat with chronic illnesses ($n=300$)

Respondents with cat with chronic illnesses	Frequency	Percentage (%)
Yes	77	25.7
No	223	74.3

Approximately one third of the respondents had experience in handling cat with kidney-related issues while 68.3% of the respondents had not have associated experience (refer to Table 10).

Table 10: The percentage distribution of respondents with experience in handling cat with kidney-related issues ($n=300$)

Respondents with experience in handling cat with kidney-related issues	Frequency	Percentage (%)
Yes	95	31.7
No	205	68.3

Among all the respondents who completed the survey, 84.7% of them revealed that the purpose for having a cat was as a pet for themselves. Besides that, some of them were cat rescuer (33.0%) and breeder (2.7%). There were 12.3% of respondents stated that they had cat(s) as pet for their children, 1.0% chose others reason (refer to Table 11).

Table 11: The percentage distribution of respondents' purpose to have cats in the household

Purpose of Having Cat	Frequency	Percentage (%)
As pet for myself	254	84.7
As pet for children	37	12.3
I rescue cats	8	2.7
I am a breeder	99	33.0
Others	3	1.0

4.3 CAT OWNERS AWARENESS AND THEIR BARRIER TO TREAT CKD

The distribution of all responses to the question whether the owners know that cats can suffer from CKD as shown in Table 12. Approximately 86.3% of the respondents correctly identified that cats can suffer from CKD, whereas 13.7% reported that they did not know that cats can have CKD.

Table 12: The percentage distribution of respondents' awareness on cat's susceptibility to chronic kidney disease ($n=300$)

Awareness on Feline Chronic Kidney Disease	Frequency	Percentage (%)
Yes	259	86.3
No	41	13.7

The three main leading sources of information which allowed the owner understand about feline CKD was from reading up from the internet (65.1%), followed by 38.7% of them was educated by veterinarians, and 38.0% of them obtained the information from pet books, magazines or newspaper articles. Interestingly, there were 21.5% of the respondents learned it from previous experience of having a cat with CKD (refer to Table 13).

Table 13: The percentage distribution of respondents' source of information on feline CKD

Sources of Information	Frequency	Percentage (%)
From previous experience of having a cat with chronic kidney disease	61	21.5
Read up from pet book/ magazine/ newspaper	108	38.0
Read up from the internet	185	65.1
From my cat's veterinary doctor	110	38.7
From my relatives or friends	54	19.0
Saw a poster available in the veterinary clinic	59	20.8
Was given a pamphlet from clinic	25	8.8
From pet show/ expo	12	4.2
From animal shelter	16	5.6
Others	30	10.6

Besides that, the respondents were also queried on their willingness to treat their cats if they have been diagnosed with CKD. About 88.3% of them reported that they would treat their cats if the cats have been diagnosed with CKD, whereas only 1.7% stated that they would not seek treatment for their cats with CKD. There were 30 respondents (10%) who chose maybe for this question (refer to Table 14).

Table 14: The percentage distribution of respondents' willingness to treat if their cats have been diagnosed with CKD ($n=300$)

Willingness to treat	Frequency	Percentage (%)
Yes	265	88.3
No	5	1.7
Maybe	30	10.0

The leading barriers that challenge them from treating their cats with CKD was mainly cost-related (70.4%). Second barrier was time-related (46.9%). About 27.2% of them revealed that incurable status of CKD prevent them from treating their cats, 12.2% reported that there is no particular reason that challenge them. Lastly, of the 3.4% who chose other for this question, 30% of them reported that administration of therapeutic treatments was a barrier for them (refer to Table 15).

Table 15: The percentage distribution of the respondents' opinion on barriers that challenge respondents from treating their cats

Barriers of treatment	Frequency	Percentage (%)
Cost-related	207	70.4
Time-related	138	46.9
No cure for heart disease	80	27.2
No particular reason	36	12.2
Others	10	3.4

More than half of the respondents (57.2%) reported that their cats are reluctant to pilling whereas 42.8% of the respondents claimed that their cats are not reluctant to pilling (refer Table 16).

Table 16: The percentage distribution of the respondents' who had cat that is reluctant to pilling ($n=297$)

Cat's reluctance to pilling	Frequency	Percentage (%)
Yes	127	42.8
No	170	57.2

Most of the respondents (80.5%) claimed that they have the ability to administer oral medication to their cats as shown in Table. Of the 19.5% respondents who reported that they do not have the ability to pill their cats, 25.8% and 6.9% of them suggested hiding medication in food and mixing crushed medication in water as alternatives to pill their cat respectively.

Table 17: The percentage distribution of the respondents' ability to pill their cat

Respondents with ability to pill their cats	Frequency	Percentage (%)
Yes	239	80.5
No	58	19.5

4.4 INTENTION TO TREAT CATS WITH CKD

4.4.1 ASSESSMENT OF MEASUREMENT MODEL

The measurement model for this study consisted of six constructs, each measured at least of one item. These constructs included anticipated regret, attitude, empathic concern, intention to treat, perceived behavioural control, and subjective norm. The assessment was done by using convergence and discriminant validity analysis. Convergent validity of constructs is the measure of constructs that theoretically should be related to each other are actually related (Trochim, 2006). Factor loadings composite reliability (CR) and average variance extracted (AVE) were

used to assess convergence validity of reflective constructs. The loading for all items must exceed the recommended value of 0.7 to accept the validity of the items, while loading lower than 0.4 showed that the items should be removed. However, if the item loading was between 0.4 to 0.7 should be considered to remove if the removal enhances the CR and AVE results. The outer loadings for reflective constructs ranged from 0.517 to 0.963. The CR value was to show the degree to which item and its recommended value was 0.7. The composite reliability of this study ranged from 0.873 to 0.975 which had exceeded the suggested value. The AVE was in the range of 0.538 to 0.908 which exceeded the recommended value of 0.5. Meanwhile, the Cronbach's alpha was in the range of 0.825 to 0.966 and must fulfil the recommended value of 0.7 (refer to Table 18). Different from validation of reflective construct, variance inflation factor (VIF) and outer weights are used to validate formative construct. In this study, the VIF values for the formative indicators ranged from 1.024 to 3.414 which is well below 5 indicating the formative indicators are not highly correlated. Outer weight of formative indicator reflects its contribution to the variance of formative construct (Petter et al., 2007). The outer weights for the formative indicators under the construct for subjective norm ranged from -0.201 to 0.973. In our case, one formative indicator (SN4) was significant with $p < 0.01$.

Table 18: Convergent Validity of Constructs

Constructs	Items	Loadings/ Weights ^a	AVE	CR	Cronbach's Alpha
Anticipated regret	AR1	0.956	0.908	0.975	0.966
	AR2	0.939			
	AR3	0.963			
	AR4	0.953			
Attitude	ATT1	0.848	0.664	0.908	0.874
	ATT2	0.812			
	ATT3	0.802			
	ATT4	0.840			
	ATT5	0.770			
Empathic concern	EC1	0.794	0.538	0.873	0.825
	EC2	0.802			
	EC3	0.749			
	EC4	0.809			
	EC5	0.670			
	EC6	0.538			
Intention to treat	INT1	0.855	0.716	0.926	0.899
	INT2	0.888			
	INT3	0.919			
	INT4	0.728			
	INT5	0.828			
Perceived behavioural control	PBC1	0.517	0.570	0.886	0.846
	PBC2	0.836			
	PBC3	0.832			
	PBC4	0.693			
	PBC5	0.802			
	PBC6	0.797			
Subjective norm ^b	SN1	-0.179	N/A	N/A	N/A
	SN2	-0.201			
	SN3	0.225			
	SN4	0.973**			

AVE: Average variance extracted, CR: Composite reliability; **p<0.01

^a For reflective scales, the standardized loading is provided; for formative scales, the weight of the linear combination is given; ^b Formative construct

The next analysis that was done was discriminant validity which used the Fornell-Lacker criterion. Discriminant validity of constructs is the measure of constructs that theoretically should not be related to each other are in fact not related (Trochim, 2006). It was examined by comparing correlations between constructs and the square root of AVE from the construct. According to Fornell-Lacker, the square root of the AVE was greater than the correlation with other constructs indicating adequate discriminant validity. Hence, the measurement model for this study was adequate discriminant validity as shown in Table 19.

Table 19: Discriminant Validity of Constructs

Latent variables	AR	ATT	EC	INT	PBC	SN
AR	0.953					
ATT	0.603	0.815				
EC	0.642	0.461	0.733			
INT	0.646	0.637	0.458	0.846		
PBC	0.484	0.583	0.382	0.625	0.755	
SN	0.375	0.376	0.244	0.422	0.383	N/A

AR: Anticipated regret; ATT: Attitude; EC: Empathic concern; INT: Intention to treat; PBC: Perceived behavioural control; SN: Subjective norm; N/A: Not applicable
 Note: Diagonals (bold face) represent the square root of the AVE while the other entries represent the correlation.

4.4.2 ASSESSMENT OF STRUCTURAL MODEL

The results of the structural model were presented in Table 3. All statistical tests were done using two-tailed t-test at the confidence level of 95%. The path coefficients concluded the strength of the hypothesized relationships among the latent variables.

The result shows that the coefficient of determination (R^2) value was 0.373 for attitude which suggested that the variables namely anticipated regret and empathic concern could explain 37.3% of the variance of attitude. For intention to treat, the R^2 value was 0.521 which indicated that the model variables namely attitude, subjective norm, and perceived behavioural control could explain 52.1% variance of intention to treat.

Table 20 revealed the relationship between intention to treat, attitude, subjective norm, perceived behavioural control, empathic concern, and anticipated regret. According to the analysis done in H1, there was a positive relationship between anticipated regret and attitude ($\beta=0.522$, $p<0.01$). Similarly, the result showed a significant association empathic concern and attitude ($\beta=0.125$, $p<0.05$) for H2. Significant association was also found between attitude and intention to treat ($\beta=0.379$, $p<0.01$) based on H3. For H4 and H5, there is also significant association between subjective norm and intention to treat ($\beta=0.147$, $p<0.05$), and significant association between perceived behavioural control and intention to treat ($\beta=0.348$, $p<0.01$). All of the t-values for the aforementioned hypotheses were more than 1.96.

Table 20: Path Coefficients and Hypothesis Testing

Hypotheses	Path coefficients	Standard beta	Standard error	T statistics	P-value	Findings
H1	AR→ATT	0.522	0.087	6.005	0.000**	Supported
H2	EC→ATT	0.125	0.072	1.727	0.042*	Supported
H3	ATT→INT	0.379	0.098	3.866	0.000**	Supported
H4	SN→INT	0.147	0.063	2.319	0.010*	Supported
H5	PBC→INT	0.348	0.094	3.721	0.000**	Supported

Note: * $p<0.05$; ** $p<0.01$

4.4.3 SUMMARY OF HYPOTHESES TESTING

The summary of hypotheses testing results was summarized in Table 21.

Table 21: Summary of Hypotheses Testing Results

Hypotheses		Results
H1	Empathic concern is related to cat owners' attitude towards intention to treat cats with CKD.	Supported
H2	Anticipated regret is related to cat owners' attitude towards intention to treat cats with CKD.	Supported
H3	Attitude is related to cat owner's intention to treat cats with CKD.	Supported
H4	Subjective norm is related to owner's intention to treat cats with CKD.	Supported
H5	Perceived behavioural control is related to owner's intention to treat cats with CKD.	Supported

CHAPTER 5.0

DISCUSSION

An increasing trend of CKD being diagnosed in cats was observed in the recent decades worldwide and similarly in Malaysia too (Lim *et al.*, 2012). Although CKD is an incurable disease, supportive treatment could relieve the symptoms and slow disease progression in order to improve quality of life in affected cats with CKD. However, the decision to treat largely depends on cat owners and may rely on several factors. In this study, factors that influence cat owners' intention to treat were identified.

Overall in this study, majority of the respondents consist of female cat owners (80.7%) and similar pattern was seen in other studies from different countries such as in the United Kingdom with 89.1% females (Foreman-Worsley *et al.*, 2021), 91.6% in Australia (Elliott *et al.*, 2019), and 86% in USA (Markovich *et al.*, 2014). It can be speculated that women were more likely to own a pet. However, the explanation on the preference of women to own a cat over a dog as pet was not investigated in this study.

Up to three fourth of the respondents belong to the age group of 20-39 years old signifying a considerable proportion of millennials owning pets. This observation were coherent with a major news media (i.e. The Washington Post and CNBC) reports that up to 76% of millennials (born between 1980 and 2000) owned pets (Bhattarai, 2016; Olick, 2018). High rates of pet ownership among the millennials were associated to delay parenthood and demand for flexible work arrangements (Ehringer, 2019). This is extremely true as raising a pet does not require constant monitoring as

compared to raising a child which then allows for flexible arrangement of schedule. Hence, it would be interesting to investigate whether the type of generations play a role in determining pet ownership in Malaysia.

In this study, most of the respondents were employed (74.4%) and approximately 80% of them had monthly household income below RM 10,000. The earning power of respondents was assumed to influence cat owners' intention to treat. In fact, Henderson (2013) revealed that monthly expenditure for pets in the US increased with income and similar could be speculated locally. In Malaysia, a survey conducted on residents of Putrajaya showed that more than 80.0% of the respondents spent RM 1 to RM 250 a month for their pets and 13.5% of them spent RM 251 to RM 500 per month where 27% of the spending were for pet healthcare (Nazri et al., 2019). However, the respondent's monthly household income was not investigated thoroughly but it could be one of the factors influencing cat owners' decision to treat if their cats had been diagnosed with CKD.

A report by the American Veterinary Medical Association (AVMA) on US pet ownership statistics from 2017 to 2018 revealed that the average number of cats owned per household was 1.8 cats. In this study, the majority (77.3%) of the respondents had 1-5 cats. In Brazil, it was found that there was no association between respondent's income and number of pets owned in household (Martins *et al.*, 2013).

Majority of the respondents (84.0%) choose cats as a pet for themselves. Many of them (41.6%) had cared for cats between 1-5 years whereas slightly more than one third of the total respondents had more than 11 years of experience in caring for their cats. When queried further on their experience managing cats with chronic illnesses,

25.7% of them responded 'Yes'. Urinary-related disease, CKD, and heart condition were the top 3 illnesses supported. Then, respondents were asked whether they had experience in handling cats with kidney-related issues, 31.7% of them had related experience which could include current experience or past experience. The proportion of respondents with experience in handling cats (31.7%) with kidney-related issues was consistent with the prevalence of chronic kidney disease in geriatric cats reported by Polzin and Bartges (2011), which was 30.0%.

Most of the respondents were aware that cats can be diagnosed with CKD and this may explain as to why there is an increase in CKD cases being diagnosed in cats. Furthermore, it was revealed that the internet was the main source of information, veterinarian was ranked second, and followed by printed material for readings such as pet book, magazine and newspaper. Nowadays, many high quality, peer reviewed articles or journals which provide scientific-based information could be easily assessed online. Hence, there is no doubt the online source which people would turn to first as it is easy, fast, and convenient for gathering information. Findings remained similar with a study by Khor *et al.* (2020) but in contrast, the veterinarian in the United Kingdom plays an important role in educating pet owners at 53.3%, followed by internet search engines at 22.6% (Kogan *et al.*, 2020). The pet owners did not view information from online sources as reliable and trustworthy as compared to their veterinary doctor. Lai *et al.* (2021) revealed that pet owners viewed online pet health information supplemental to information provided by veterinarians and wanted their veterinarians to confirm the reliability and accuracy of the information.

Despite the high willingness in cat owners to treat their cats if diagnosed with CKD, a significant proportion of respondents informed that cost was an important barrier and time-commitment was ranked second. In the United States, cost-related was the top barrier to accessing veterinary care (Kogan *et al.*, 2021). Other than that, cost discussion during veterinarian-client-patient interaction should be initiated by the veterinarian in order for the clients to have better understanding on where the cost arises. For example, a veterinarian could explain professionally about why such a diagnostic testing was relevant or what kind of clinical benefits would be received by pets from particular treatment which would eventually facilitate clients to make informed decision (Coe *et al.*, 2008). In contrast, Lue (2008) revealed that owners with strong attachment with their pets will disregard cost and were more likely to seek veterinary support for their pets.

Time-related was another barrier that may discourage treatment for their pets in progressive diseases such as CKD. Some owner may be willingly sacrifice their time for their pets' wellbeing but owners that had time commitment can convinced that benefits to treatment outweigh and the time given. The ability to pills a cat is entirely dependent on cat owner ability and willingness to treat. About 57.2% of the respondents had cats that were not compliant despite owners having the skills to give oral medication. In contrast, Siven (2016) found that cat owners' success rate in medicating their cats was as high as 76%. Most failures in administration of oral medication in cat could be attributed to the behaviour of their cat, having adverse effects such as salivation due to unpleasant taste of drugs or having an independent that detest being restrained (Thombre, 2004; Siven *et al.*, 2016).

The attitude construct has been the major focus of theory and research in social and behavioural science. According to Rosenberg and Hovland (1960), attitude can be based on three primary types of information namely beliefs, feelings, and actions. In this study, two affective components namely empathic concern and anticipated regret were designed as predictors of attitude. Positive relationship was observed where these two affective predictors explained 37.3% of the variance in attitude towards intention to treat. Almost all of the respondents had tender and concerned feelings for strays (99.0%), being protective towards stray animals (98.0%). Majority of the respondents (93.0%) described themselves as soft hearted and 98.0% of the respondents also thought that they were touched by things they see happen. Almost all of them regarded their cats as family members and agreed that cats should get treated if diagnosed with CKD, just like how their family members and friends should receive treatment if diagnosed with CKD. This study also showed that respondents would experience several feelings which include regret (99.0%), upset (98.0%), guilt (99.0%), and worry (98.0%) if they did not treat their cats. Hence, it can be concluded that empathic concern and anticipated regret had moderate relationship with attitude towards intention to treat.

The final result from the analysis of the structural model revealed that 52.1% of the variance in intention was explained by attitude, subjective norm, and perceived behavioural control suggesting a strong relationship between these three indicators and intention to treat cats with CKD. According to Ajzen (1991), attitude is the favourable or unfavourable evaluation of the behaviour in question. In this survey, almost all of the respondents (99.0%) agreed that bringing their cat for regular check-

up was important as most of these respondents thought that it was good to ensure their cats were healthy. A majority (97.0%) of the respondents also agreed continuing life-long therapy for their cats' benefits was a wise decision. Furthermore, a high proportion (97.0%) of the respondents revealed that they would update the veterinarian about the treatment of their cats at home during each visit, and 98.0% of them would reach out to the veterinarian when their cats looked sick. Hence, with the positive attitude shown by most of the respondents as discussed above, this would contribute positively to cat owners' intention to treat their cats with CKD.

Subjective norm was defined as individual perceived social pressure to perform or not to perform a behaviour (Ajzen, 1991) which in this case the intention to treat. Subjective norm was found to be positively correlated with cat owners' intention to treat CKD. For instance, family support (75.0%) was found to be influential for the majority of the respondents when making a decision to treat. Almost all of the respondents (98.0%) agreed that veterinarian's support was the most important when they seek treatment for their cats which concluded that veterinarians played an important role in providing adequate support and encouraging cat owners to treat their CKD cats so that affected cats could have a better quality of life.

Perceived behavioural control is defined as perceived ease or difficulty in performing a behaviour (Ajzen, 1991). Of all the respondents, 88.0% of them perceived themselves to have the resources (time and money) to provide treatment for their CKD cats; 97.0% of them were confident that they can nurse their cats according to veterinarian's instruction; 99.0% of them were compliant with the prescribed medication for their cats by veterinarian; 92.0% of them had the skill to administer

oral medication; 97.0% of the respondents would coax feed their cats patiently if their cats had no appetite; and 98.0% agreed to use the prescribed therapeutic diet for their CKD cats. Hence, perceived behavioural control was found to be positively associated with cat owners' intention to treat CKD. This indicates high control over the behaviour in cat owners would contribute to a stronger intention to treat cats with CKD.



CHAPTER 6.0

CONCLUSION AND RECOMMENDATION

The level of awareness towards CKD in cats among respondents was considered good as more than 80% of the respondents knew that cats are susceptible to CKD. This study also concluded that attitude, subjective norms, and perceived behavioural control were positively associated with cat owners' intention to treat. Generally, cat owners that had positive attitude, with access to resources, and gaining support from important referents would have higher intention to treat their cats. Similarly, affective predictors such as empathic concern and anticipated regret were also found to have positive association with attitude towards intention to treat. This indicated that if cat owners had high empathy and able to anticipate regret from not treating, they would more likely have positive attitude towards treatment. In this study, the veterinarian plays an important role in encouraging cat owners in decision making for treatment especially in chronic illness, likewise CKD. Therefore, veterinarian should come up with strategies during consultation to motivate cat owners and support their level of empathy that formed their positive attitude towards treatment. Veterinarian to them is an important referent to cat owners and hence encouragement given to their clients with provision of professional advice in management of CKD which would improve their compliance towards treatment. From there, cats diagnosed with CKD would have good quality of life when cat owners had improved intention to treat.

One of the limitations in this study was that convenience sampling as a non-random sampling technique was used in this study which may not represent the whole

population. Future studies may employ random sampling strategy to make the data more representative which can be generalized to the entire population. Secondly, administration of interviewer assisted questionnaire could be more advantageous as it provides assistance to the respondents to understand the questions better which subsequently minimises information bias. Lastly, future studies may look into other affective components that affect attitude such as trust, attachment to pets, and level of grief.



CHAPTER 7.0

REFERENCES

- Ajzen, I. (1991). The Theory of Planned Behaviour. *Organizational Behaviour and Human Decision Processes*, 50(2), 179–211. doi:10.1016/0749-5978(91)90020-t
- Andrianova, N. V., Buyan, M. I., Zorova, L. D., Pevzner, I. B., Popkov, V. A., Babenko, V. A., Silachev, D. N., Plotnikov, E. Y., & Zorov, D. B. (2019). Kidney Cells Regeneration: Dedifferentiation of Tubular Epithelium, Resident Stem Cells and Possible Niches for Renal Progenitors. *International Journal of Molecular Sciences*, 20(24), 6326. <https://doi.org/10.3390/ijms20246326>
- Armitage, C. J., & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A meta-analytic review. *British Journal of Social Psychology*, 40(4), 471–499. <https://doi.org/10.1348/014466601164939>
- AVMA. (2017). U.S. Pet Ownership Statistics. American Veterinary Medical Association. <https://www.avma.org/resources-tools/reports-statistics/us-pet-ownership-statistics>
- Bagozzi, R. P. (1978). The Construct Validity of the Affective, Behavioural, and Cognitive Components of Attitude by Analysis of Covariance Structures. *Multivariate Behavioural Research*, 13(1), 9–31. https://doi.org/10.1207/s15327906mbr1301_2
- Bartges, J. W. (2012). Chronic Kidney Disease in Dogs and Cats. *Veterinary Clinics of North America: Small Animal Practice*, 42(4), 669–692. <https://doi.org/10.1016/j.cvsm.2012.04.008>

- Bartges, J., & Polzin, D. (2011). *Nephrology and Urology of Small Animals*. In *Google Books*. John Wiley & Sons. https://books.google.com.my/books/about/Nephrology_and_Urology_of_Small_Animals.html?id=otbdFBIIoD4C&redir_esc=y
- Batson, C. D. (1991). The Altruism Question: Toward a Social-Psychological Answer. In *PhilPapers*. Lawrence Erlbaum. <https://philpapers.org/rec/BATTAQ>
- Batson, C. D., Polycarpou, M. P., Harmon-Jones, E., Imhoff, H. J., & et al. (1997). Empathy and Attitudes: Can feeling for a member of a stigmatized group improve feelings toward the group? *Journal of Personality and Social Psychology*, 72(1), 105–118. <https://doi.org/10.1037//0022-3514.72.1.105>
- Bhattarai, A. (2016). Millennials are Picking Pets over People. *The Washington Post*. <https://www.washingtonpost.com/news/business/wp/2016/09/13/millennials-are-picking-pets-over-people/>
- Boyd, L. M., Langston, C., Thompson, K., Zivin, K., & Imanishi, M. (2008). Survival in Cats with Naturally Occurring Chronic Kidney Disease (2000-2002). *Journal of Veterinary Internal Medicine*, 22(5), 1111–1117. <https://doi.org/10.1111/j.1939-1676.2008.0163.x>
- Brown, C. A., Elliott, J., Schmiedt, C. W., & Brown, S. A. (2016). Chronic Kidney Disease in Aged Cats. *Veterinary Pathology*, 53(2), 309–326. <https://doi.org/10.1177/0300985815622975>
- Chen, H., Dunaevich, A., Apfelbaum, N., Kuzi, S., Mazaki-Tovi, M., Aroch, I., & Segev, G. (2020). Acute on Chronic Kidney Disease in Cats: Etiology, clinical and Clinicopathologic Findings, Prognostic Markers, and Outcome. *Journal of Veterinary Internal Medicine*. <https://doi.org/10.1111/jvim.15808>

- Chu, C. D., Chen, M. H., McCulloch, C. E., Powe, N. R., Estrella, M. M., Shlipak, M. G., & Tuot, D. S. (2021). Patient Awareness of CKD: A Systematic Review and Meta-analysis of Patient-Oriented Questions and Study Setting. *Kidney Medicine*, 3(4), 576-585.e1. <https://doi.org/10.1016/j.xkme.2021.03.014>
- Clore, G., & Schnall, S. (2005). The Influence of Affect on Attitude. ResearchGate; unknown.https://www.researchgate.net/publication/232598049_The_Influence_of_Affect_on_Attitude
- Coe, J. (2008). Communication during Veterinarian-Client-Patient Interactions in Companion Animal Practice. https://atrium.lib.uoguelph.ca/xmlui/bitstream/handle/10214/20395/Coe_JasonB_PhD.pdf?sequence=1&isAllowed=y
- Dana, H., Forrester, S. D., Angela, W. R., Larry, G. A., & Todd, L. T. (n.d.). Chronic Kidney Disease, part 1: Overview. *Clinician's Brief*. <https://www.cliniciansbrief.com/article/chronic-kidney-disease-part-1-overview>
- Elliott, Howell, McLeod, & Bennett. (2019). Perceptions of Responsible Cat Ownership Behaviours among a Convenience Sample of Australians. *Animals*, 9(9), 703. <https://doi.org/10.3390/ani9090703>
- Falindah Padlee, S., Ali, A., Fadhiha Mokhtar, N., & Nur 'Atikah Zulkiffli, S. (2013). Regret and Satisfaction Influencing Attitude and Intention in Using Homestay Terminology: The Structural Approach. *Asian Social Science*, 9(17). <https://doi.org/10.5539/ass.v9n17p94>
- Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention, and Behaviour: An introduction to theory and research. Reading, Mass: Addison-Wesley Pub. Co.

- Foreman-Worsley, R., Finka, L. R., Ward, S. J., & Farnworth, M. J. (2021). Indoors or Outdoors? An International Exploration of Owner Demographics and Decision Making Associated with Lifestyle of Pet Cats. *Animals, 11*(2), 253. <https://doi.org/10.3390/ani11020253>
- Fritsch, D. A., & Jewell, D. E. (2015). Acceptance and Effects of a Therapeutic Renal Food in Pet Cats with Chronic Kidney Disease. *Veterinary Record Open, 2*(2), e000128. <https://doi.org/10.1136/vetreco-2015-000128>
- Henderson, S. (2013). Spending on pets 2007–2011. U.S. Bureau of Labour Statistics Retrieved from <https://www.bls.gov/opub/btn/volume-2/spending-on-pets.htm>
- Hua, K. K., Siew, K. K., Chong, L. Y., & Jun, L. Y. (2020). Would Cat Owners Intend to Treat their Cats If Diagnosed with Heart Disease? *Journal of Veterinary Behaviour. https://doi.org/10.1016/j.jveb.2020.05.014*
- Jacqueline, B. (n.d.). *Chronic Kidney Failure in Cats*. Embrace Pet Insurance. <https://www.embracepetinsurance.com/health/chronic-kidney-failure-in-cats>
- Janis, I. L., & Mann, L. (1977). Decision making: A Psychological Analysis of Conflict, Choice, and Commitment. Psycnet.apa.org. <https://psycnet.apa.org/record/1978-00284-000>
- Jepson, R. E. (2016). Current Understanding of the Pathogenesis of Progressive Chronic Kidney Disease in Cats. *Veterinary Clinics of North America: Small Animal Practice, 46*(6), 1015–1048. <https://doi.org/10.1016/j.cvsm.2016.06.002>

- Kan, M. P. H., & Fabrigar, L. R. (2017a). Theory of Planned Behaviour. *Encyclopedia of Personality and Individual Differences*, 1–8. https://doi.org/10.1007/978-3-319-28099-8_1191-1
- Kogan, L. R., Accornero, V. H., Gelb, E., & Slater, M. R. (2021). Community Veterinary Medicine Programs: Pet Owners' Perceptions and Experiences. *Frontiers in Veterinary Science*, 8, 678595. <https://doi.org/10.3389/fvets.2021.678595>
- Kogan, L. R., Little, S., & Oxley, J. (2021). Dog and Cat Owners' Use of Online Facebook Groups for Pet Health Information. *Health Information & Libraries Journal*. <https://doi.org/10.1111/hir.12351>
- Lai, N., Khosa, D. K., Jones-Bitton, A., & Dewey, C. E. (2021). Pet Owners' Online Information Searches and the Perceived Effects on Interactions and Relationships with their Veterinarians. *Veterinary Evidence*, 6(1). <https://doi.org/10.18849/ve.v6i1.345>
- Lim, M., Lyn, Abdullah, R., Dhaliwal, G., & Ariff Omar, M. (2012). Disease Prevalence and Clinicopathological Changes in Senior and Geriatric Cats Presented to University Veterinary Hospital, University Putra Malaysia <http://psasir.upm.edu.my/id/eprint/26772/1/PROCEEDING%206.pdf>
- Lue, T. W., Pantenburg, D. P., & Crawford, P. M. (2008). Impact of the Owner-Pet and Client-Veterinarian Bond on the Care that Pets Receive. *Journal of the American Veterinary Medical Association*, 232(4), 531–540. [doi:10.2460/javma.232.4.531](https://doi.org/10.2460/javma.232.4.531)

- Marino, C. L., Lascelles, B. D. X., Vaden, S. L., Gruen, M. E., & Marks, S. L. (2013). Prevalence and Classification of Chronic Kidney Disease in Cats Randomly Selected from Four Age Groups and in Cats Recruited for Degenerative Joint Disease Studies. *Journal of Feline Medicine and Surgery*, 16(6), 465–472. <https://doi.org/10.1177/1098612x13511446>
- Markovich, J. E., Freeman, L. M., Labato, M. A., & Heinze, C. R. (2014). Survey of Dietary and Medication Practices of Owners of Cats with Chronic Kidney Disease. *Journal of Feline Medicine and Surgery*, 17(12), 979–983. <https://doi.org/10.1177/1098612x14563097>
- Martins, C. M., Mohamed, A., Guimarães, A. M. S., de Barros, C. da C., Pampuch, R. dos S., Svoboda, W., Garcia, R. de C. M., Ferreira, F., & Biondo, A. W. (2013). Impact of Demographic Characteristics in Pet Ownership: Modelling Animal Count According to Owners Income and Age. *Preventive Veterinary Medicine*, 109(3), 213–218. <https://doi.org/10.1016/j.prevetmed.2012.10.006>
- Nazri, M., Bee, A., & Azwan, S. (2019). Assessing the Status of Pet Ownership in the Community of Putrajaya. *Malaysian journal of veterinary research*, 10(1), 61–71. http://www.dvs.gov.my/dvs/resources/user_16/MJVR%20Vol10.%20No.1/MJVR-V10N1-p61-71.pdf
- O'Neill, D. G., Church, D. B., McGreevy, P. D., Thomson, P. C., & Brodbelt, D. C. (2014). Longevity and Mortality of Cats Attending Primary Care Veterinary Practices in England. *Journal of Feline Medicine and Surgery*, 17(2), 125–133. [doi:10.1177/1098612x14536176](https://doi.org/10.1177/1098612x14536176)

- Olick, D. (2018, August 31). Millennials Put Pets First When Buying a Home. CNBC.
<https://www.cnbc.com/2018/08/31/millennials-put-pets-first-when-buying-a-home.html>
- Parker, V. J. (2021). Nutritional Management for Dogs and Cats with Chronic Kidney Disease. *Veterinary Clinics of North America: Small Animal Practice*, 51(3), 685–710. <https://doi.org/10.1016/j.cvsm.2021.01.007>
- Payne, J. R., Brodbelt, D. C., & Luis Fuentes, V. (2015). Cardiomyopathy Prevalence in 780 Apparently Healthy Cats in Rehoming Centres (the CatScan study). *Journal of Veterinary Cardiology*, 17, S244–S257.
<https://doi.org/10.1016/j.jvc.2015.03.008>
- Pei-Fen, L., & Dennis, Xie. (2020). Most Cat Owners not Alert to Kidney Disease: survey. *Taipei Times*.
<https://www.taipetimes.com/News/taiwan/archives/2020/04/26/2003735326>
- Petter, Straub, & Rai. (2007). Specifying Formative Constructs in Information Systems Research. *MIS Quarterly*, 31(4), 623.
<https://doi.org/10.2307/25148814>
- Plantinga, E. A., Everts, H., Kastelein, A. M. C., & Beynen, A. C. (2005). Retrospective Study of the Survival of Cats with Acquired Chronic Renal Insufficiency Offered Different Commercial Diets. *The Veterinary Record*, 157(7), 185–187. <https://doi.org/10.1136/vr.157.7.185>
- Plantinga, L. C., Tuot, D. S., & Powe, N. R. (2010). Awareness of Chronic Kidney Disease Among Patients and Providers. *Advances in Chronic Kidney Disease*, 17(3), 225–236. <https://doi.org/10.1053/j.ackd.2010.03.002>

- Polzin, D. J. (2011). Chronic Kidney Disease in Small Animals. *Veterinary Clinics of North America: Small Animal Practice*, 41(1), 15–30.
<https://doi.org/10.1016/j.cvsm.2010.09.004>
- Reynolds, B. S., & Lefebvre, H. P. (2013). Feline Chronic Kidney Disease. *Journal of Feline Medicine and Surgery*, 15(1_suppl), 3–14.
<https://doi.org/10.1177/1098612x13495234>
- Reynolds, C., Oyama, M., Rush, J., Rozanski, E., Singletary, G., Brown, D., & Hogan, D. (2010). Perceptions of Quality of Life and Priorities of Owners of Cats with Heart Disease. *Journal of Veterinary Internal Medicine*, 24(6), 1421-1426.
[doi:10.1111/j.1939-1676.2010.0583.x](https://doi.org/10.1111/j.1939-1676.2010.0583.x)
- Rosenberg, M.J. (1960). Cognitive, affective, and behavioural components of attitudes. *Attitude Organization and Change*; Yale University Press.
<https://ci.nii.ac.jp/naid/10015436767/>
- Ross, S. (2016). Utilization of Feeding Tubes in the Management of Feline Chronic Kidney Disease. *Veterinary Clinics of North America: Small Animal Practice*, 46(6), 1099–1114. <https://doi.org/10.1016/j.cvsm.2016.06.014>
- Roudebush, P., Polzin, D. J., Ross, S. J., Towell, T. L., Adams, L. G., & Forrester, S. D. (2009). Therapies for Feline Chronic Kidney Disease. *Journal of Feline Medicine and Surgery*, 11(3), 195–210.
<https://doi.org/10.1016/j.jfms.2009.01.004>
- Saffrey, C., Summerville, A., & Roese, N. J. (2008). Praise for Regret: People Value Regret Above Other Negative Emotions. *Motivation and Emotion*, 32(1), 46–54. <https://doi.org/10.1007/s11031-008-9082-4>

- Schaefer, G. da C., Vidor, S. B., Jeremias, J. T., Pontieri, C. F. F., Brunetto, M. A., & Costa, F. V. A. da. (2021). Clinical and Nutritional Follow-Up of Cats with Chronic Kidney Disease Fed with a Renal Prescription Diet. *Acta Sci. Vet. (Online)*, Pub. 1801–Pub. 1801.
<https://pesquisa.bvsalud.org/portal/resource/pt/vti-762303>
- Sent, U., Gössl, R., Elliott, J., Syme, H. M., & Zimmering, T. (2015). Comparison of Efficacy of Long-term Oral Treatment with Telmisartan and Benazepril in Cats with Chronic Kidney Disease. *Journal of Veterinary Internal Medicine*, 29(6), 1479–1487. <https://doi.org/10.1111/jvim.13639>
- Sheppard, B. H. (1988). The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research. ResearchGate.
https://www.researchgate.net/publication/298348626_The_Theory_of_Reasoned_Action_A_Meta-Analysis_of_Past_Research_with_Recommendations_for_Modifications_and_Future_Research
- Simonson, I. (1992). The Influence of Anticipating Regret and Responsibility on Purchase Decisions. *Journal of Consumer Research*, 19(1), 105.
<https://doi.org/10.1086/209290>
- Sivén, M., Savolainen, S., Rantilä, S., Männikkö, S., Vainionpää, M., Airaksinen, S., Raekallio, M., Vainio, O., & Juppo, A. M. (2017). Difficulties in Administration of Oral Medication Formulations to Pet Cats: an e-Survey of Cat Owners. *The Veterinary Record*, 180(10), 250.
<https://doi.org/10.1136/vr.103991>

- Sniehotta, F. F., Presseau, J., & Araújo-Soares, V. (2014). Time to retire the theory of planned behaviour. *Health Psychology Review*, 8(1), 1–7.
<https://doi.org/10.1080/17437199.2013.869710>
- Sparkes, A. H., Caney, S., Chalhoub, S., Elliott, J., Finch, N., Gajanayake, I., Langston, C., Lefebvre, H. P., White, J., & Quimby, J. (2016). ISFM Consensus Guidelines on the Diagnosis and Management of Feline Chronic Kidney Disease. *Journal of Feline Medicine and Surgery*, 18(3), 219–239.
<https://doi.org/10.1177/1098612x16631234>
- Syme, H. M., Barber, P. J., Markwell, P. J., & Elliott, J. (2002). Prevalence of systolic hypertension in cats with chronic renal failure at initial evaluation. *Journal of the American Veterinary Medical Association*, 220(12), 1799–1804.
<https://doi.org/10.2460/javma.2002.220.1799>
- Thombre, A. G. (2004). Oral Delivery of Medications to Companion Animals: Palatability Considerations. *Advanced Drug Delivery Reviews*, 56(10), 1399–1413. <https://doi.org/10.1016/j.addr.2004.02.012>
- Trochim, W. M. K., & Donnelly, J. P. (2006). *The Research Methods Knowledge Base* (3rd ed.). United States: Atomic Dog Publishing.
- Van den Putte, B., Hoogstraten, J., & Meertens, R. (1991). Years of the Theory of Reasoned Action of Fishbein and Ajzen: A meta-analysis. *Unpublished manuscript, University of Amsterdam.*

CHAPTER 8.0

APPENDIX

Appendix I: Questionnaire on Cat Owner's Perception toward Feline CKD

12/11/21, 10:52 PM

Survey on Cat Owners Knowledge, Attitude and Practice (KAP) towards Feline Chronic Kidney Disease (CKD) and Their ...

Survey on Cat Owner's Knowledge, Attitude and Practice (KAP) towards Feline Chronic Kidney Disease (CKD) and Their Perception towards Kidney Disease

*Required

Please read the following information carefully.

A very good day to you.

We would like to invite you to participate in our survey that would help us understand the current knowledge, attitude, practices and perception of cat owners in Malaysia on feline chronic kidney disease.

This is a final year project and findings from this study will be important in giving us preliminary information and allow us to come up with strategies (i.e. educational, intervention) to instill or improve the pet owner's knowledge on this disease and allow clinicians to plan better in terms of motivating cat owners to treat if their pet is diagnosed with chronic kidney disease.

The questionnaire is divided into 4 sections: i) Demographic information; ii) Cat ownership information; iii) Awareness, challenges, knowledge and practice; iv) Behavioral study.

The estimated time to complete the survey is 15 minutes.

Participation is voluntary and if you felt that you were uncomfortable in providing the information, you may discontinue participation.

If you have any questions about the study, please contact: Chee Hor Yan (horvanchee@gmail.com) or Mark Choong (markchoong0814@gmail.com). This study has obtained ethical clearance from the Ethics Committee for Research Involving Human Subject (JKEUPM). The approval number for this study is JKEUPM-2021-234.

Students are supervised by Dr Khor Kuan Hua (kkhor@upm.edu.my), Department of Veterinary Clinical Studies, Faculty of Veterinary Medicine, Universiti Putra Malaysia.

1. Please tick. Your participation is greatly appreciated. *

Tick all that apply.

- I understand that I have the right to withdraw at any time without giving any reason.
- I understand that all information provided will remain confidential & use only for research purposes.
- By clicking on the NEXT button, I hereby agree to become a respondent.

Section A: Demographic characteristic

No.	Question	Options
1.	State	<ul style="list-style-type: none"> • Johor • Kedah • Kelantan • Melaka • Negeri Sembilan • Pahang • Penang • Perak • Perlis • Sabah • Sarawak • Selangor • Terengganu • Kuala Lumpur • Labuan Putrajaya
2.	Gender	<ul style="list-style-type: none"> • Male • Female
3.	Age	<ul style="list-style-type: none"> • ≤19 years old • 20 - 29 years old • 30 - 39 years old • 40 - 49 years old • ≥50 years old
4.	What is the approximate range of your monthly household income?	<ul style="list-style-type: none"> • <RM 2000 • RM 2000 - RM 5000 • RM 5001 - RM 10,000 • RM 10001 - RM 20000 • RM 20000
5.	What is the highest level of education you have completed?	<ul style="list-style-type: none"> • None • Primary school • Secondary school • First degree or Diploma • Master degree or PhD
6.	What is the field/ sector of your current employment/ study?	<ul style="list-style-type: none"> • Not working or studying at the moment • Self-employed • Life sciences • Social sciences

Section B: Cat ownership information

No.	Question	Option
1.	How many cat(s) do you have?	
2.	How many years of experience do you have in caring for cats?	
3.	Do you have cat(s) which are having chronic illnesses?	<ul style="list-style-type: none"> • No • Yes, please specify
4.	Do you have experience in handling a pet(s) with kidney related issues?	<ul style="list-style-type: none"> • No • Yes
5.	What is the purpose of having cats in your household?	<ul style="list-style-type: none"> • As a pet for myself • As a pet for my children • I am a breeder • I rescue cats • Other

Section C: Cat Owners' awareness and their barrier to treat CKD

No.	Question	Option
1.	Do you know that cats can suffer from chronic kidney disease?	<ul style="list-style-type: none"> • Yes • No
2.	How did you know that cats can have CKD?	<ul style="list-style-type: none"> • From previous experience of having a cat with CKD • Read up from pet book/ magazine/ newspaper • Read up from the internet • My cat's veterinary doctor told me • My relatives or friends told me • I saw a poster available in veterinary clinic • I was given a pamphlet from veterinary clinic • From a pet show/ expo • From the animal shelter • Other
3.	Would you treat your cat if he/she has been diagnosed with CKD?	<ul style="list-style-type: none"> • Yes • No • Maybe
4.	What seems to be the barrier that challenge you from treating your cat (s) with CKD?	<ul style="list-style-type: none"> • Cost-related • Time-related • There is no cure for CKD • No particular reason • Other

5.	My cats are not compliant when it comes to pilling (i.e. fierce, you get scratch)	<ul style="list-style-type: none"> • Yes • No
6.	I know how to pill my cats (giving medication orally – directly into the mouth)	<ul style="list-style-type: none"> • Yes • No, please state other methods (i.e. hide in food, crush and mix with water)

Section D: Behavioural study

No.	Intention to treat
1.	I intend to follow up with my cat's CKD treatments.
2.	I intend to change my cat's diet. Change diet to support the kidney.
3.	I intend to adopt measures to improve my cat's appetite / smooth transition to a new diet.
4.	I intend to adopt measures to encourage my cat to take in more fluid.
5.	I intend to administer medications recommended by the veterinarian.

No.	Perceived behavioural control
1.	I have the resources (i.e. time and money) to support my cat's CKD treatments.
2.	I am confident that I can nurse my cat according to the veterinarian's instruction.
3.	I am compliant with the prescribed medication to be administered to my cat.
4.	I have the skill to administer oral drugs to my cat.
5.	I have the patience to coax my cat to eat when it has no appetite.
6.	I will use the therapeutic diet as prescribed for my cat.

No.	Subjective norm
1.	Family
2.	Close friend
3.	Peers/ colleagues
4.	Veterinarian

No.	Attitude
1.	1. It is wise to bring my cats for his/her regular check-ups.
2.	2. It is a good idea to ensure that my cat is healthy.
3.	3. It is wise to continue the life-long therapy (medication) for the benefits of my cat's life.
4.	4. I will update my veterinarian during each check-ups on my cat's condition during treatment at home.
5.	5. I will get in touch immediately with my veterinarian when my cat looks sick.

No.	Empathic concern
1.	I often have tender, concerned feelings for stray animals.
2.	When I see stray animals, I feel kind of protective towards them.
3.	My cat is like a family member.
4.	I am often quite touched by things that I see happen.
5.	I would describe myself as a pretty soft-hearted person.
6.	I have/heard of friend or family diagnosed with CKD. Hence, I strongly believe a cat with CKD should be treated.

No.	Anticipated regret
1.	If I did not treat my cat, I would feel regret.
2.	If I did not treat my cat, I would feel upset.
3.	If I did not treat my cat, I would feel guilty.
4.	If I did not treat my cat, I would worry.

End of Questionnaire

Thank you