Knowledge, Attitude, and Practices of Nutritional Assessments among Small Animal Veterinarians in Klang Valley, Malaysia

By

Cheah Sook Peng, Candace

A research paper submitted to the Faculty of Veterinary Medicine, Universiti Malaysia Kelantan in partial fulfilment of the requirements for the degree of Doctor of Veterinary Medicine

Faculty of Veterinary Medicine
UNIVERSITI MALAYSIA
KELANTAN

2024

LIST OF ABBREVIATIONS

AKI	Acute Kidney Injury
APC	Annual Practising Certificate
CKD	Chronic Kidney Disease
DCM	Dilated Cardiomyopathy
DVM	Doctor of Veterinary Medicine
GNC	Global Nutrition Committee
KAP	Knowledge, Attitudes, and Practices
MSc	Master of Science
MVSc	Master of Veterinary Science
PGDip	Postgraduate Diploma
PhD	Doctor of Philosophy
SDM	Shared Decision-Making
WSAVA	World Small Animal Veterinarian Association

ORIGINAL LITERARY WORK DECLARATION

I hereby certify that the work embodied in this thesis is the result of the original research and has not been submitted for a higher degree to any other University or Institution.

☐	**OPEN ACCESS**	I agree that my thesis is to be made immediately available as hardcopy or online open access (full text).
☐	**EMBARGOES**	I agree that my thesis is to be made available as hardcopy or online (full text) for a period approved by the Post Graduate Committee. Dated from _until __.
☐	**CONFIDENTAL**	(Contains confidential information under the Official Secret Act 1972)*
☐	**RESTRICTED**	(Contains restricted information as specified by the organisation where research was done)*

I acknowledge that Universiti Malaysia Kelantan reserves the right as follows.

1. The thesis is the property of Universiti Malaysia Kelantan
2. The library of Universiti Malaysia Kelantan has the right to make copies for the purpose of research only.
3. The library has the right to make copies of the thesis for academic exchange.

SIGNATURE OF CANDIDATE	SIGNATURE OF SUPERVISOR
NRIC/PASSPORT NO.	NAME OF SUPERVISOR
DATE:	DATE:

Knowledge, Attitude, and Practices of Nutritional Assessments among Small Animal Veterinarians in Klang Valley, Malaysia

ABSTRACT

Nutrition plays a vital role in small animals' overall health and well-being, and veterinarians are instrumental in ensuring optimal nutritional care for companion animals. This study aimed to assess the knowledge, attitudes, and practices (KAP) of small animal veterinarians in Klang Valley, Malaysia regarding nutrition and nutritional assessments. This study aimed to (i) assess the KAP of small animal veterinarians towards nutrition; (ii) determine if socio-demographic characteristics influence KAP; and (iii) examine the association between the level of KAP. The research design involved a cross-sectional survey, and data were collected through a self-administered questionnaire involving 50 respondents. Data was analysed using IBM SPSS Statistic version 27.0, using linear regression analysis and Pearson's correlation coefficients. The findings revealed that a majority of participants possessed a poor level of knowledge (n=23, 46%), and moderate levels of attitude (n=32/50, 64%) and practices (n=26/50, 52%) toward small animal nutrition. Age had the greatest impact on participants' knowledge ($\beta = 0.277$), while years of experience influenced attitude scores ($\beta = 0.150$), and qualification level was associated with participants' practice ($\beta = 0.169$). The study revealed significant positive correlations among Total Knowledge Scores (TKS), Total Attitude Scores (TAS), and Total Practice Scores (TPS), with medium-level relationships observed ($p=0.002$ for TKS and TAS, $p=0.010$ for TAS and TPS). The study highlights the importance of ongoing education and training in optimising nutritional care for small animals, emphasising the need for informed nutritional interventions in veterinary medicine.

Keywords: Nutrition; Small animal veterinarians; Klang Valley, Malaysia; Knowledge, Attitudes, Practices (KAP); Companion animals; Veterinary medicine; WSAVA Nutritional Assessment Guidelines; GNC Nutrition Toolkit

Pengetahuan, Sikap, dan Amalan Penilaian Pemakanan dalam kalangan Doktor Haiwan Kesayangan di Lembah Klang, Malaysia

ABSTRAK

Pemakanan memainkan peranan penting dalam kesihatan dan kesejahteraan keseluruhan haiwan kecil, dan doktor haiwan memainkan peranan penting dalam memastikan penjagaan pemakanan yang optimum untuk haiwan tersebut. Kajian ini bertujuan untuk menilai pengetahuan, sikap dan amalan (KAP) doktor haiwan kecil di Lembah Klang, Malaysia terhadap pemakanan dan penilaian pemakanan. Kajian ini bertujuan untuk (i) menilai KAP doktor haiwan kecil terhadap pemakanan; (ii) menentukan sama ada ciri-ciri sosio-demografi mempengaruhi KAP; dan (iii) meneliti perkaitan antara tahap KAP. Reka bentuk penyelidikan ini melibatkan tinjauan keratan rentas, dan data yang dikumpulkan melalui soal selidik yang ditadbir sendiri dan melibatkan 50 responden. Data yang dikumpulkan telah dikaji menggunakan IBM SPSS Statistic versi 27.0, serta menggunakan analisis regresi linear dan pekali korelasi Pearson. Dapatan kajian ini menunjukkan bahawa majoriti peserta mempunyai tahap pengetahuan yang lemah (n=23, 46%), tahap sikap yang sederhana (n=32/50, 64%), dan tahan amalan yang sederhana (n=26/50, 52%) terhadap pemakanan haiwan kecil. Ciri umur para peserta memberikan impak tertinggi terhadap skor pengetahuan para peserta (β = 0.277), sementara ciri tahun pengalaman menunjukkan sumbangan terbesar kepada skor sikap peserta (β = 0.150), dan tahap kelayakan menunjukkan sumbangan terbesar kepada skor amalan peserta (β = 0.169). Kajian ini telah mendedahkan korelasi positif yang signifikan antara Jumlah Skor Pengetahuan (TKS), Jumlah Skor Sikap (TAS), dan Jumlah Skor Amalan (TPS), berserta dengan hubungan tahap sederhana yang dilihatkan (p= 0.002 untuk TKS dan TAS, p=0.010 untuk TAS dan TPS). Kajian ini menekankan keperluan untuk pendidikan dan latihan lanjut untuk meningkatkan dan menekankan kepentingan pemahaman dan pelaksanaan penjagaan pemakanan yang optimum bagi haiwan kecil.

Kata kunci: Pemakanan; Doktor haiwan haiwan kesayangan; Lembah Klang, Malaysia; Pengetahuan, Sikap, Amalan (KAP); Haiwan kesayangan; Perubatan veterinar; Garis Panduan Penilaian Pemakanan WSAVA; Kit Alat Pemakanan GNC

ACKNOWLEDGMENTS

I wish to express my heartfelt gratitude to Dr. Goh Soon Heng for his enduring patience, unwavering support, expert guidance, and invaluable insights throughout the entire research process. My deepest thanks go to my family members for their continuous support and encouragement, as their belief and prayers have been the driving force behind my academic journey, sustaining me through both highs and lows. I am also grateful to my partner for providing both moral and technical support, which played a crucial role in my study. Special appreciation goes to my friends within and outside veterinary school, who have been a constant source of support throughout the challenging five-year veterinary medicine program. Lastly, I want to acknowledge the members of DVM 11 for contributing to the joy and motivation that made this academic journey more meaningful and memorable.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

Page No.

CHAPTER 1

INTRODUCTION

1.1 Research Background

Beyond mere sustenance, proper nutrition plays a pivotal role in maintaining health, preventing and managing diseases, supporting healing and recovery, and contributing to the overall longevity and quality of life for animals (Freeman et al., 2011). Veterinarians recognize the individualised nature of nutritional needs, considering factors such as species, breed, age, health status, and lifestyle when formulating tailored dietary recommendations. This necessity is also emphasised by the growing interest in nutrition among pet owners as well (Blees et al., 2021).

Veterinarians play a crucial role in promoting optimal health and preventing diseases through informed nutritional interventions. Extensive documentation highlights the favourable impact of nutritional support on hospitalised veterinary patients, encompassing improved hospital outcomes, reduced susceptibility to infection, enhanced tolerance of invasive procedures, accelerated recovery, and shorter discharge times (Lumbis & de Scally, 2020). Consistent and suitable feeding across all life stages not only aids in averting diet-associated diseases but also plays a crucial role in managing various other health conditions (Chandler & Takashima, 2014).

The integration of nutrition into the academic training of general veterinary practitioners is often insufficient within university-level veterinary or veterinary nursing curricula and is not consistently recognized within the profession. While practitioners have firsthand experience witnessing the transformative impact of nutrition on their patients, they

frequently encounter challenges in providing informed recommendations due to a lack of comprehensive tools (Chandler & Takashima, 2014).

Hence, the Nutritional Assessment Guidelines, introduced by the World Small Animal Veterinary Association (WSAVA) Global Nutrition Committee (GNC), have been established to serve as a valuable tool for both the veterinary healthcare team and pet owners. This initiative is designed to facilitate the provision of optimal nutrition for dogs and cats, ensuring that their dietary requirements are customised to meet their specific needs. (Lumbis & de Scally, 2020; Freeman et al., 2011).

As outlined in the guidelines, nutritional assessment plays an essential role in routine patient care, as nutrition is known as the fifth vital assessment (Freeman et al., 2011). The assessment starts with the identification of disease-related nutritional risk factors by conducting a comprehensive examination of dietary and lifestyle history, coupled with the assessment of body weight and composition through body condition and muscle condition scoring. The outcome of this evaluation informs the development of personalised nutritional recommendations, the formulation of a feeding management strategy, and the establishment of a follow-up plan that involves consistent monitoring and assessments of compliance (Blees et al., 2021).

However, despite establishing the guidelines, it is still unclear how well small animal veterinarians are applying them in their diverse veterinary practices, nor is it unclear how much of a nutritional assessment or diet history veterinarians are practising.

Therefore, conducting a study to evaluate veterinarians' comprehension, perspectives, and practice on nutritional assessment methods could uncover potential disparities in their approaches. The data gathered may be valuable for informing future curriculum planning, enhancing educational approaches related to nutritional assessment within the veterinary community, and further elevating the level of veterinary care provided to companion animals.

1.2 Research Problem Statement

The limited emphasis on nutritional assessments among small animal veterinarians may result in an inconsistent range of standards in how veterinarians approach nutritional care for their patients. These variations in knowledge and practices may lead to suboptimal nutritional recommendations, potentially impacting the health and well-being of companion animals. Currently, no studies have been conducted to assess the knowledge, attitude, and practices of small animal veterinarians in Malaysia regarding nutritional assessments. Similar studies have been done in countries such as the United States, South Africa, Belgium, and the Netherlands. This study seeks to investigate the awareness and perspectives of small animal veterinarians in Klang Valley concerning nutritional assessments for companion animals, due to the vast majority of small animal veterinarians in Malaysia being based in the Klang Valley. The collected data aims to shed light on the existing understanding and practices of these veterinarians in nutritional assessments and their perceptions of the importance of incorporating such assessments into their daily practice.

1.3 Research Questions

a) What is the level of knowledge among small animal veterinarians about nutrition?

b) What is the attitude of small animal veterinarians towards nutrition?

c) What are the practices among small animal veterinarians toward nutrition?

1.4 Research Hypothesis

a) Small animal veterinarians in Klang Valley exhibit good levels of knowledge about nutrition.

b) Small animal veterinarians in Klang Valley demonstrate moderate attitudes towards nutrition.

c) Small animal veterinarians in Klang Valley employ moderate practices concerning nutrition.

1.5 Research Objectives

a) To determine the level of knowledge about nutrition among small animal veterinarians in Klang Valley.

b) To determine the level of attitudes of small animal veterinarians in Klang Valley towards nutrition.

c) To determine the diverse practices related to nutrition employed by small animal veterinarians in Klang Valley.

CHAPTER 2

LITERATURE REVIEW

2.1 Nutrition

2.1.1 Importance of Nutrition in Veterinary Medicine

Pet nutrition potentially has better compliance compared to human nutrition. While humans have the free will to have access to all foodstuffs, owners provide food for their pets, and unlike humans, pets are less particular about their food selections (Davies, 2016). While pet nutrition was once regarded as a supportive measure of low priority, it is increasingly being recognized as an important therapeutic intervention in the care of critically ill patients. (Chan & Freeman, 2006). This is shown by a recent study which revealed that 64% of veterinary healthcare teams recognize nutritional evaluation as a vital assessment (Lumbis & Scally, 2020). Moreover, another study shows that there has been increasing recognition of the impact of nutrition on small animal health, as evidenced by successful dietary management stories in veterinary clinical nutrition (Davies, 2016).

The historical evolution of the recognition of nutrition's role in small animal health is also evident in the changing perception of obesity in companion animals. In the past, many veterinary surgeons did not consider obesity as a serious concern, viewing it merely as a cosmetic issue (German, 2010). However, with the increasing prevalence of obesity in companion animals, there has been a shift towards recognizing it as a significant health issue requiring attention and management. This is supported by another study that mentions that obesity can reduce the life expectancy of both humans and dogs (Muñoz-Prieto et al., 2018).

Furthermore, there has been a significant focus on the incorporation of novel ingredients, formulations, and nutritional supplements in small animal nutrition, especially in

recent years. These developments are driven by factors such as consumer demand, nutritional sustainability, and the desire to address specific health concerns. For instance, there is a growing trend in incorporating microbiome-targeted ingredients like prebiotics and probiotics in pet foods to support gastrointestinal health (Wernimont et al., 2020). Additionally, the use of insects as feed and dietary supplements for dogs and cats has gained traction, with mealworms and black soldier fly larvae being utilised in pet food formulations (Valdés et al., 2022).

Moreover, the introduction of plant-based diets for pets has also emerged as a response to consumer preferences. These unconventional ingredients such as legumes and pulse ingredients in pet food showed potential as alternative protein sources (Mansilla et al., 2019). However, concerns regarding potential nutrient deficiencies have been raised especially with the use of plant-based ingredients (Fantinati et al., 2021). Allergenic potential, as some legumes, such as lupine, may pose challenges for allergic pets (Villa & Costa, 2020) Consumption of pet foods containing ingredients such as peas, lentils, and potatoes, as well as grain-free diets, has been associated with an increased risk of dilated cardiomyopathy (DCM) in dogs (Smith et al., 2021; Adin et al., 2021; Smith et al., 2022; Quest et al., 2020). However, further research is needed to evaluate the specific impact of unconventional ingredients on the development of DCM.

Pet owners' perceptions and purchasing habits play a significant role in shaping the evolving nutrition of the pet food market, with preferences varying based on factors such as appearance, smell, protein content, and the presence of specific ingredients (Vinassa et al., 2019; Vinassa et al., 2020). As the industry continues to evolve, there is a need for ongoing research to evaluate the nutritional adequacy and safety of novel dietary practices, alternative diets, and uncommon ingredients for companion animals (Prata, 2022). A veterinarian's recommendation carries significant influence among pet owners when deciding what to feed their pets. Recognizing this, numerous pet food companies invest significantly in the

veterinary community, aiming to capture veterinarians' attention for their products and, ideally, secure their endorsement (Fascetti & Delaney, 2012; Alvarez et al., 2022). This underscores the importance of collaboration between the pet food industry, veterinarians, and researchers to ensure that novel ingredients and formulations align with the nutritional requirements and well-being of dogs and cats.

2.1.2 Current State of Small Animal Nutrition Practices

Pet owners can be significantly swayed by the marketing claims put forth by pet food manufacturers. Non-compliance with veterinary advice on nutrition poses another significant challenge, with only 21% reported compliance for feeding therapeutic diets on veterinary recommendation (Davies, 2016). Hence, veterinarians must offer guidance rooted in evidence-based nutrition. Central to this approach is the implementation of nutritional assessments for every pet during each visit, enabling the education of clients on the distinct nutritional requirements of their pets. A veterinarian is equipped with the skills to assess a patient based on history and physical examinations. While conducting a nutritional assessment, it is essential to take into account patient characteristics, which encompass factors such as age, physiological status, activity level, body condition score, muscle condition, and nutrient-responsive disorders (Rollins & Murphy, 2019).

Unfortunately, there is a decrease in the utilisation of veterinary services alongside an increase in the reported prevalence of preventable diseases in pets (Baldwin et al., 2010). This emphasises the significance of addressing nutritional needs, especially during healthy pet appointments (Baldwin et al., 2010). A recent study notes that most veterinarians do not discuss nutrition with clients at each veterinary visit (Morgan et al., 2017). Significantly, veterinarians engage less in nutritional discussions during healthy pet appointments than during appointments for sick pets, suggesting a potential lapse in addressing the nutritional

needs of healthy animals (Alvarez et al., 2022). Pet owners may not be aware that when veterinarians recommend a specific therapeutic food, it is typically grounded in scientifically proven strategies or has undergone testing specifically for the relevant condition or disease (Fascetti & Delaney, 2012). Hence, ensuring that there is follow-up with clients is equally crucial to emphasise the significance of the dietary recommendation. Recommendations lacking follow-up may be perceived as less critical and may further lead to reduced client compliance. Ultimately, monitoring the progress of a patient offers an opportunity to explore and choose an alternative, yet still suitable, food if the initial recommendation proves ineffective.

The use of evidence-based medical communication methodologies in clinical training is recommended to improve veterinary communication and ensure that recommendations are based on scientifically proven strategies (Bard et al., 2017). This is essential for building trust and ensuring that pet owners are well-informed about the scientific basis of therapeutic food recommendations. By incorporating discussions about nutrition into routine healthy pet appointments, veterinarians can potentially contribute to preventing common preventable diseases in animals.

2.1.3 Barriers to Implementing Nutritional Assessments

WSAVA advocates for the routine conduct of nutritional assessments for cats and dogs during every veterinary appointment and consultation (MacMartin et al., 2018). This recommendation is supported by the American Animal Hospital Association, which provides guidelines to enhance the length and quality of pets' lives through proper nutrition (Lemke et al., 2015). However, navigating the intricacies of nutritional and diet history assessment poses a great challenge for small animal veterinarians, as practitioners encounter multifaceted barriers that impede the collection of accurate and complete information needed to ensure the

optimal health of their patients. These barriers can hinder the ability of veterinary healthcare teams to provide comprehensive recommendations for every patient. Limited consultation time has been identified as a significant barrier, impacting the veterinarian's capacity to conduct thorough nutritional assessments and provide tailored recommendations (Alvarez et al., 2022).

Furthermore, the complexity and sensitivity of addressing issues such as obesity in pets require veterinarians to have further training and intentionality in gathering in-depth nutritional history and effectively communicating with clients to address patient needs (Phillips et al., 2017). Additionally, client resistance to changing pet food brands, misinformation obtained online, and difficulty in keeping up with the myriad of available products have been reported as barriers to discussing nutrition during healthy pet appointments (Alvarez et al., 2022). Financial constraints, client awareness, willingness to act, and cultural barriers have also been recognized as significant obstacles to providing optimal healthcare for dogs, which may extend to being a barrier in providing nutritional advice to pet owners (Wallis et al., 2023; Park et al., 2021). Unfortunately, assessments are only more likely conducted in cases of existing health complaints, dietary-related conditions, or malnutrition (Alvarez et al., 2022).

2.1.4 Impact of Nutritional Assessments on Animal Health Outcomes

The impact of diet on small animal health and wellbeing is profound, as virtually every cellular process is affected by diet, making dietary management foundational in addressing small animal disorders (Gugliandolo et al., 2020). Furthermore, research has shown that healthy dietary patterns, including the role of plant-based foods and animal products, can prevent cardiometabolic diseases, highlighting the importance of nutrition in small animal care (Petersen et al., 2017). Moreover, the influence of nutrition on the ageing process in pets has been recognized, emphasising the relevance of current knowledge of ageing in pet populations (Butterwick, 2015).

2.1.5 Veterinarian-Client Communication on Nutrition

Effective communication between veterinarians and pet owners on nutrition is pivotal for fostering a partnership and ensuring the overall well-being of the patient (Phillips et al., 2017; German, A. J., 2010). Studies consistently underscore the significance of nutritional assessment and recommendations in veterinary healthcare, with a focus on improving client motivation, adherence to recommendations, and ultimately, patient health (Kamleh et al., 2020; Bard et al., 2017; Members, 2011).

To enhance client involvement, veterinarians are encouraged to incorporate shared decision-making behaviours during consultations, particularly in discussions related to nutrition (Janke et al., 2021). However, the dynamics of dietary advice-giving can be delicate, potentially impacting adherence and shared decision-making. Addressing this gap in veterinary practice calls for further training for veterinarians in comprehensive nutritional history gathering and effective information sharing, especially in discussions related to obesity management (Phillips et al., 2017).

WSAVA advocates for a team approach, continuous nutritional education, implementation of appropriate protocols, and focused client communication. This approach, aligned with the established Nutritional Assessment Guidelines, is essential for ensuring comprehensive and effective veterinary care (Members, 2011).

Research indicates that communication strategies employing shared decision-making facilitate owner participation in decision-making, leading to increased satisfaction with veterinary consultations (Ito et al., 2022). Additionally, the influence of affective relationships with veterinarians and satisfaction with communication on pet owner loyalty is highlighted in studies, emphasising the importance of relationship-centred veterinary care and effective communication in building strong bonds with clients (Küper & Merle, 2019). In conclusion,

effective communication strategies are foundational in ensuring collaborative decision-making, client satisfaction, and ultimately, the overall success of veterinary care.

2.1.6 WSAVA Nutritional Assessment Guidelines

WSAVA introduced their Nutritional Assessment Guidelines to help veterinarians overcome the challenges of obtaining standard, accurate, and comprehensive information which is crucial for optimising the health and well-being of their patients. These guidelines emphasise the importance of a team approach to continuous nutritional education, implementation of suitable protocols, and focused client communication. The guidelines cover various topics related to animal feed, veterinary medicine, and animal nutritional physiological phenomena, providing a holistic approach to pet care (Freeman et. al., 2011). By aligning with WSAVA's Nutritional Assessment Guidelines, practitioners can enhance the accuracy and efficacy of their assessments, integrating them into regular patient care, and ultimately contributing to the overall health and quality of life of their patients.

2.1.7 Global Nutrition Committee (GNC) Nutrition Toolkit

WSAVA's GNC has been instrumental in developing nutritional assessment guidelines and a nutritional toolkit, including a nutritional assessment checklist to facilitate this assessment (Freeman, 2015). The committee has developed the Global Nutrition Toolkit which provides extensive support for assessing body condition, muscle condition, and dietary history, reflecting a holistic approach to nutritional evaluation. The toolkit aims to provide practical guidance and resources for nutritional consulting in regular veterinary practices (Blees et al., 2021). Furthermore, it offers guidance on assessing the nutritional status of animals, which is crucial for addressing various health conditions such as protein-losing enteropathy. One study revealed that the GNC committee has also been involved in ensuring that the diets of dogs comply with their recommendations, as evidenced by efforts to contact manufacturers to determine compliance with the WSAVA GNC Guidelines (Kathrani et al., 2018).

The WSAVA Global Nutrition Toolkit facilitates standardised nutritional assessment practices across veterinary settings. By providing a set of guidelines and practical aids, the toolkit promotes consistency in the assessment of nutritional status, body condition, and dietary history, regardless of the specific veterinary practice or geographical location (Lumbis & Scally, 2020, Freeman, 2015) This standardisation contributes to improved quality of care for small animals, as it ensures that all veterinary professionals have access to a common framework for conducting nutritional assessments and implementing appropriate interventions.

Another significant benefit of the WSAVA Global Nutrition Toolkit is its role in promoting education and knowledge dissemination in the field of small animal nutrition. The toolkit provides guidelines, practical tools, and educational resources such as instructional videos and case studies. These resources support the continuous professional development of veterinary professionals, enabling them to enhance their knowledge and skills in small animal nutrition assessment and management. By promoting ongoing education and knowledge dissemination, the toolkit contributes to the advancement of small animal nutrition practices and the overall improvement of veterinary care (Lumbis & Rinkinen, 2022).

2.2 Therapeutic food versus non-therapeutic food

2.2.1 Composition and Nutrient Profile

2.2.1.1 Therapeutic Food

Therapeutic food, also known as a prescription or veterinary therapeutic diets, is formulated to address specific health conditions or nutritional needs in pets. It also refers to specially formulated diets designed to manage or treat specific medical conditions in these animals. There is an acknowledgment that numerous diseases reap advantages from a multimodal strategy, encompassing medical and/or surgical interventions, alongside targeted nutritional support involving a carefully selected choice of ingredients and formulation. This

underscores the pivotal role nutrition plays in achieving optimal case management for many patients, extending beyond the mere provision of essential daily calories and nutrients. (Morgan, 2022; Kirk, 2006)

Depending on the diet needed, various ingredients in therapeutic food have been made, altered, and enhanced to provide the proper nutrition for the animal and their ailments or conditions. A study by Pekel et al. (2020) highlights the significance of taste preferences and diet palatability in cats, suggesting that augmenting the fat content of a diet is a prevalent strategy in managing anorexia in feline patients. This finding has implications for the nutrition profile of veterinary-prescribed diets, emphasising the importance of considering palatability factors, including fat content, when formulating diets to enhance adherence and nutritional intake in cats with specific health conditions. Renal diets on the other hand are typically restricted in protein, phosphorus, and sodium, and are supplemented with potassium, omega-3 fatty acids, B vitamins, and fat content, and are alkalinizing (Korman & White, 2013; Archer, 2019).

To regulate blood sugar levels in pets with diabetes, specialised diets with controlled levels of carbohydrates and balanced nutrients are made into these special diets. A low-carbohydrate diet is known to improve glycemic control and blood lipid levels and lead to greater weight loss compared with conventional control diets (Fukuyama et al., 2020). Furthermore, some diets have developed novel proteins like high-grade protein hydrolyzation, resulting in a diet primarily composed of single amino acids and short peptides. This is achieved through the use of poultry feathers as a protein source, which differs significantly in protein composition from other meat-based poultry diets (Olivry et al., 2017). These diets employ enzymatic hydrolysis to decrease the antigenicity of native proteins. The process involves cleaving peptide bonds in proteins sourced from novel proteins like chicken liver, soybeans, and poultry feathers (Bizikova & Olivry, 2016).

While veterinary diets play a crucial role in patient management, either as part of a comprehensive approach or as the primary intervention for clinical purposes, it's important to recognize that they should not be viewed as a "treatment" or "cure" comparable to authorised veterinary medicines. This might seem contradictory, especially considering their pivotal role in managing certain conditions such as urolithiasis, obesity, or early-stage chronic kidney disease in dogs and cats. Nevertheless, veterinary dietetic feeds lack authorization as veterinary medicines, distinguishing them from substances like antibiotics and anti-inflammatories. Despite their evident "clinical benefit" in disease management, nutritional interventions, regardless of formulation and ingredient content, should fundamentally be regarded as a means of supporting the patient (Morgan D., 2022).

2.2.1.2 Non-therapeutic Food

In the context of pet nutrition, there exists a dichotomy between therapeutic and non-therapeutic food options. Non-therapeutic food encompasses a variety of pet foods, including dry and canned pet food, as well as treats, which are not specifically formulated to address medical conditions or nutritional deficiencies in animals (Serhan et al., 2022).

Non-therapeutic food, often commercially produced, is primarily designed to offer balanced nutrition for the average, healthy pet without specific health concerns. These formulations meet general nutrient requirements and have contributed to the increased life expectancy of pets (Prata, 2022; Dodd et al., 2020). The palatability of these foods is crucial, as even nutritionally sound options may be overlooked by pets if they lack sensory appeal, potentially leading to low repeat purchase intention by pet owners (Samant et al., 2021). This underscores the importance of balanced pet food that not only fulfils nutritional requirements but also appeals to the pets themselves. Additionally, the rising popularity of raw meat-based diets indicates a growing interest in alternative pet food options, highlighting the significance of providing balanced nutrition through diverse food formats (Morelli et al., 2019).

However, a shift is evident as pet owners increasingly explore alternatives beyond conventional commercial pet foods. This includes the adoption of therapeutic diets, vegetarian diets, and various home-prepared diets (Kore et al., 2009). This trend is fueled by concerns related to preservatives in commercial pet foods, potential health risks, and a general desire for more natural dietary options (Morelli et al., 2021; Bianco et al., 2020).

Despite these trends, concerns have been raised about the nutritional sustainability of commercial pet foods. The formulation of these foods often caters to consumer demand rather than nutritional requirements, potentially leading to issues like overconsumption, food wastage, and obesity in pets (Swanson et al., 2013). This highlights the evolving landscape of pet nutrition, where the choices made by pet owners are influenced by a complex interplay of health considerations, environmental concerns, and individual preferences.

2.2.2 Medical Conditions and Therapeutic Diets

On discussing the role of therapeutic diets in veterinary medicine, these specialised nutritional interventions are crucial for managing various conditions like diabetes, kidney disease, gastrointestinal issues, and joint problems (Sparkes et al., 2015; Segev et al., 2010; Ambrosini et al., 2020). Specifically designed by veterinarians to meet the unique nutritional needs of pets with health issues, these diets play a significant role in improving the overall prognosis of affected animals. For example, in managing feline diabetes mellitus, prescribed diets are a key part of clinical management (Sparkes et al., 2015).

Studies have also explored the effectiveness of specific ingredients and dietary interventions. Fritsch et al. (2022) demonstrated the effectiveness of a fibre-supplemented dietary intervention in dogs with chronic large-bowel diarrhoea. Weemhoff et al. (2021) conducted a trial assessing a therapeutic food containing egg and phytonutrients in managing pruritic signs in dogs, highlighting the role of specific ingredients in therapeutic diets.

In managing chronic kidney disease (CKD) in cats, therapeutic diets are recommended based on studies like the one by Roudebush et al. (2009), which evaluated the effectiveness of a therapeutic renal food in cats through a randomised controlled clinical trial. Summers et al. (2020) stressed the importance of exclusively feeding cats with CKD stages 2 to 4 with a renal therapeutic food. These findings emphasise the practical application of therapeutic diets in supporting pets' health. Similarly, in dogs with chronic kidney disease, therapeutic renal diets prescribed by veterinarians have been shown to slow down the progression of the disease (Perini-Perera et al., 2021; Pedrinelli et al., 2020).

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Study design and study setting

This cross-sectional study was conducted among small animal veterinarians localised in Klang Valley, Malaysia, which comprised small animal veterinarians working in the public or private sector as well as locum small animal veterinarians, from December 1st to December 22nd, 2023.

3.2 Sample size and sampling method

The study population was estimated to be 200 small animal veterinarians based in the Klang Valley. This estimation was established based on a recent study that manually distributed 199 surveys on Occupational Zoonotic Disease Questionnaires to 95 small animal private practices in the Klang Valley region, including the Companion Animal Clinic at UVH, UPM (Ismail R., 2020). This is assuming that each clinic is estimated to have 2 veterinarians. The sample size was established through a power calculation utilizing the *Z* formula. The estimation indicated that a minimum of 132 participants was required to achieve a 95% confidence level, allowing for a maximum acceptable difference of 0.05 in detecting Knowledge, Attitudes, and Practices (KAP) proportions in the population. Participants for the study were selected through a simple random sampling method.

$$\text{Sample size, n} = \frac{N*[\frac{z^2(1-p)}{e^2}]}{[N-1+(\frac{Z^2p(1-p)}{e^2})]}$$

3.3 Inclusion and exclusion criteria

The study covered veterinarians actively practicing in the care of small animals within the Klang Valley within the age frame of 18 to 70 years old. They must be a licensed veterinarian that has an active Annual Practising Certificate (APC) that is valid for the year 2023. Exclusion criteria will encompass veterinarians primarily involved in large animal or mixed-practice veterinary services. Additionally, individuals who have retired, are on extended leave, do not have an active APC, or are not currently practicing in the Klang Valley will be excluded to maintain the relevance and contemporaneity of the data collected.

3.4 Questionnaire design

The instrument used in this study was a self-administered web-based questionnaire as shown in Appendix C which consisted of 4 main sections. Section A consisted of socio-demographic questions (e.g., age, gender, qualification level, role/occupation) while sections B, C, and D comprised of knowledge, attitude, and practice questions respectively to evaluate the levels of knowledge, attitude, and practice of nutritional assessments among small animal veterinarians within the Klang Valley. The design of the knowledge section domain is to assess the knowledge of veterinarians regarding nutrition, WSAVA's Nutritional Assessment Guidelines, and their Global Nutrition Toolkit.

Four dichotomous questions ("Yes" and "No") were prepared to assess their knowledge. Each response of "Yes" will be given a score of 1, while a score of 0 will be given for those who choose "No". Additionally, one multichoice question on the methods used to stay informed and updated on the latest developments and research findings in the field of pet nutrition is asked, and each criteria selected by the respondent will garner a score of 1. The maximum number of points to collect from this question is 11. The veterinarian's level of knowledge will be graded into poor, moderate, or good. Respondents with scores of 0 to 5, 6 to 10 and 11 to 15 were considered to have a poor, moderate, and good level of knowledge,

respectively.

Six questions with a five-point Likert scale (“not interested”, “a little interested”, “somewhat interested”, “very interested”, and “extremely interested”; “Never “Less than 1 hour”, “1 to 5 hours”, “6 to 10 hours”, and “ More than 10 hours”; “Not at all confident”, “Slightly confident”, “Moderately confident”, “confident” and “Extremely confident”) were prepared to measure the veterinarian’s attitude towards therapeutic food and non-therapeutic food. The total attitude score will be summed up with a maximum score of 30. Respondents with a score of 1- 10 will be considered to have a poor attitude, a score of 11-20 to have a moderate attitude, and a score of 21-30 to have a good attitude.

Finally, eleven questions with a six-point Likert scale (“No, never”, “Only for patients who are sick, overweight, or believed to be malnourished or at risk of malnourishment”, “At least 25% of overall consults”, “At least 50% of overall consults”, “At least 75% of overall consults” and “Always”), two questions with a five-point Likert scale (“No, never”, “At least 25% of overall consults”, “At least 50% of overall consults”, “At least 75% of overall consults” and “Always”) and one multiple choice question consisting of 7 nutritional assessment methods were prepared.

For the six-point Likert scale, the response will be scored with those choosing “No, never” given a score 1, “Only for patients who are sick, overweight, or believed to be malnourished or at risk of malnourishment” with score 2, “At least 25% of overall consults” with score 3, “At least 50% of overall consults” with score 4, “At least 75% of overall consults” with score 5 and “Always” with a score of 6. For the five-point Likert scale, the response will be scored with those choosing “No, never” given a score of 1, “At least 25% of overall consults” with a score of 2, “At least 50% of overall consults” with a score of 3, “At least 75% of overall consults” with a score of 4 and “Always” with a score of 5. For the multiple choice question, the respondent will be given a point for every nutrition assessment method they select in which the maximum number of points to collect from this question is 7.

The total practice scores have a maximum score of 83 and respondents with scores 0-27 consider exercise poor practices, scores 28-55 having moderate practices, and scores 56-83 exercise good practices.

3.5 Statistical Analysis of Data

This study was translated into Malay language and was checked for content validation by a veterinary lecturer and a small animal veterinarian in the industry. A pre-testing study was conducted before the study with 2 respondents with similar criteria. Reliability testing conducted using Cronbach's alpha as noted in Appendix A, on KAP sections revealed that a measurement of more than 0.7 indicated an acceptable internal consistency reliability. Due to the non-normal distribution of the data (p-value less than 0.05), normality could not be achieved; consequently, the normal scores (using Bloom's formula) were employed in SPSS to transform the data according to Appendix B and achieve a more normal distribution. The continuous data was then used for further statistical analysis of association and correlation.

The data collected were analysed using IBM® SPSS® Version 27 (IBM®, USA). The categorical variables were descriptively analysed. Linear regression was used to determine the association between the categorical variables. The highest beta (β) value, while omitting the negative sign, was selected among all sociodemographic variables to identify which variable had the most association with the total score of knowledge, attitude and practice respectively. This means the change in the dependent variable for a one-unit change in that predictor variable. Also, a p-value of ≤ 0.05 was considered significant. Pearson's correlation coefficient was performed to measure the correlation between total scores of knowledge, attitude, and practice. The correlation was significant at a level of $p \leq 0.05$.

CHAPTER 4

RESULT

4.1 Socio-demographic characteristics of respondents

A total of 50 participants were surveyed with the majority being female (n = 41/59, 82%) and between the age of 26 - 39 years old (n = 33/50, 66%). Most respondents have a qualification level of Doctor of Veterinary Medicine (n = 46/50, 92%) and are practising as a veterinarian in the private sector/practice (n = 40/50, 80%) with the most common type of practice being general practice (n = 32/50, 64%). The correspondents' years of experience is mostly 1 - 3 years (n = 17/50. 34%) and the correspondents' perceived level of formal education in companion animal nutrition is Some (n = 21/50, 42%).

Table 4.1 Respondents' socio-demographic characteristics (n = 50)

Socio-demographic characteristic	**Total (*n = 50)***	
	n	**%**
Age (year)		
18 – 25	13	26%
26 – 39	**33**	**66%**
40 - 59	4	8%
60 - 70	0	0%
>70	0	0%
Gender		
Female	**41**	**82%**
Male	9	18%
Qualification Level		
DVM (Doctor of Veterinary Medicine)	**46**	**92%**
MSc (Master of Science)	2	4%
MVSc (Master of Veterinary Science)	1	2%
PGDip (Postgraduate Diploma)	1	2%
PhD (Doctor of Philosophy)	0	0%
Veterinary Diplomate	0	0%
Other	0	0%

Socio-demographic characteristic	Total (*n = 50)*	
	n	**%**
Role / Occupation		
Veterinarian in private sector/practice	**40**	**80%**
Veterinarian in public sector/practice	5	10%
Locum veterinarian	4	8%
Other (Pharmaceutical Veterinarian)	1	2%
Years of Experience		
Less than a year	13	26%
1 - 3 years	**17**	**34%**
4 - 6 years	5	10%
7 - 9 years	4	8%
≥ 10 years	11	22%
Type of Practice		
Animal Medical Center or Animal Hospital	6	12%
Felines only	6	12%
General practice	**32**	**64%**
General practice with emergency option	5	10%
Canines only	0	0%
Other (Pharmaceuticals and animal nutrition)	1	2%
Perceived level of formal education in companion animal nutrition		
None	2	4%
Very little	12	24%
Some	**21**	**42%**
Adequate	15	30%
A significant amount	0	0%

4.2 Knowledge of nutrition among small animal veterinarians

Table 4.2 assesses the participants knowledge on nutrition for small animals. Most participants provide small animal nutrition-related advice to others (n = 40/50, 80%). Based on this question, should participants provide small animal-nutrition related advice to others, a follow up question was posed on whom they provide advice to, enabling each respondent to select multiple groups. These respondents primarily provide advice to pet owners (n = 40/40, 100%), fellow veterinary staff (n = 25/40, 63%) as well as to veterinary students (n = 10/40, 25%).

Most participating small animal veterinarians are also aware of nutrition's importance as the fifth vital assessment after temperature, pulse, respiration and pain (n = 32/50, 64%). However, the majority of participants have not yet heard of the WSAVA's Nutritional Assessment Guidelines (n = 30/50, 60%). As for those that have (n = 20/50, 40%), most have heard it through WSAVA's media channels (n = 13/20, 65%).

The majority of participants were also unaware of the existence of WSAVA's Global Nutrition Toolkit (n = 40/50, 80%) with those that have heard of it (n= 10/50, 20%) being primarily from WSAVA's media channels again (n = 7/10, 70%). Those familiar with the toolkit are mostly familiar with its Body Condition Score chart (n = 10/10, 100%), Muscle Condition Score charts (n = 6/10, 60%), and Calorie Recommendations (n = 5/10, 50%).

When asked about the methods the participants use to keep themselves informed and updated on the latest developments and research findings in the field of pet nutrition, the majority responded that it is through Webinars and Online Courses (n = 41/50, 82%), Online Databases (n = 31/50, 62%), Conferences and Seminars (n = 30/50, 60%), and Continuing Education Courses (n = 30/50, 60%).

Table 4.2 Knowledge of nutrition among small animal veterinarians (*n*=50)

Knowledge-based item	Total			
	Yes		No	
	n	%	*n*	%
Q1: As part of your current job role, do you provide small animal nutrition-related education and/or advice to others (i.e. pet owners, veterinary staff, students)	**40**	**80%**	10	20%
Q3: Are you aware of the concept of nutritional evaluation as the fifth vital assessment (after temperature, pulse, respiration, and pain)?	**32**	**64%**	18	36%
Q4: Prior to this survey, were you aware of the World Small Animal Veterinary Association (WSAVA) Nutritional Assessment Guidelines?	20	40%	**30**	**60%**
Q6: Prior to this survey, were you aware that WSAVA's Global Nutrition Committee has developed a Global Nutrition Toolkit?	10	20%	**40**	**80%**

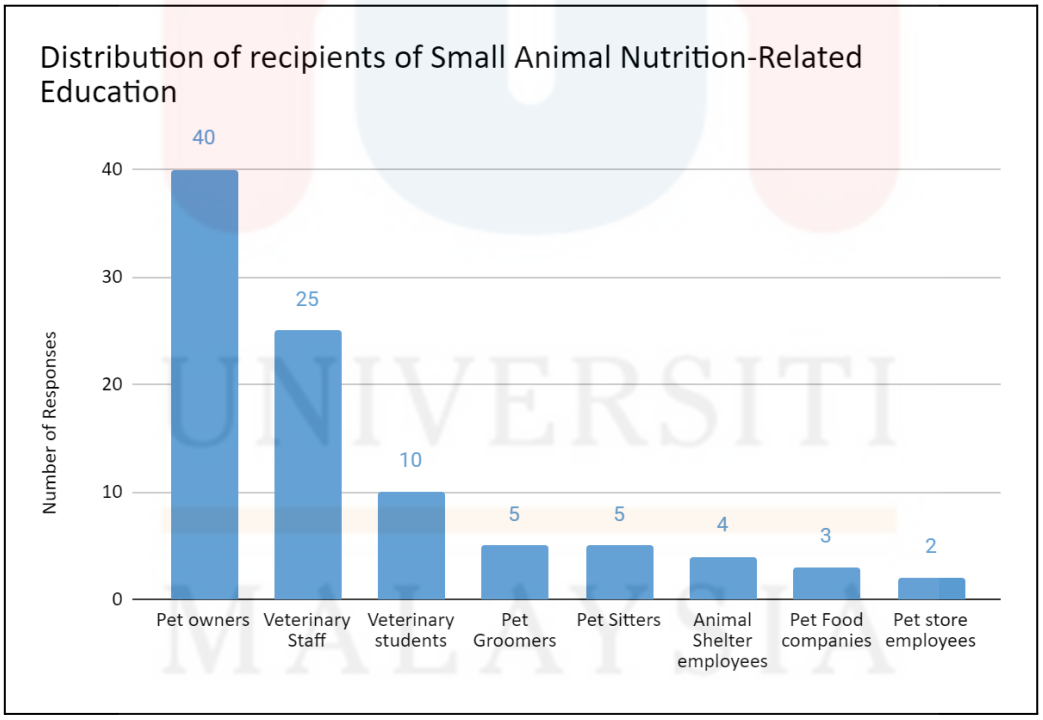

Figure 4.2.1 Total responses (n=40) based on multichoice question on to whom respondents provide small animal nutrition-related education to

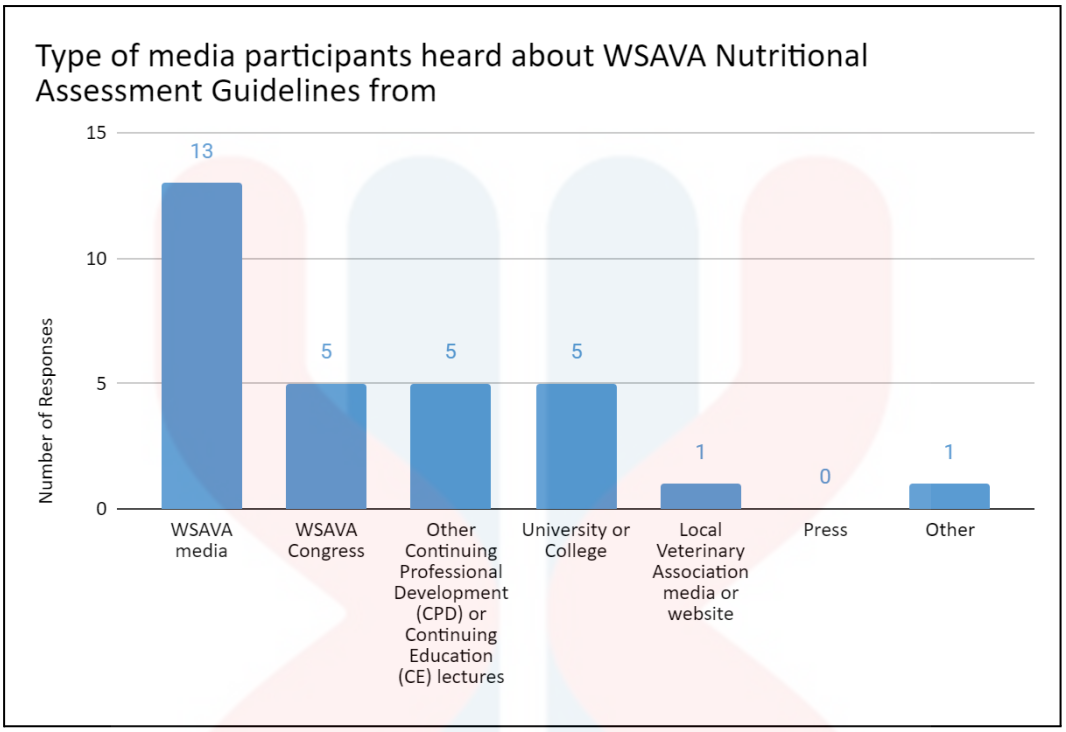

Figure 4.2.2 Total response (n=20) from respondents on where they have heard of the WSAVA Nutritional Assessment Guidelines

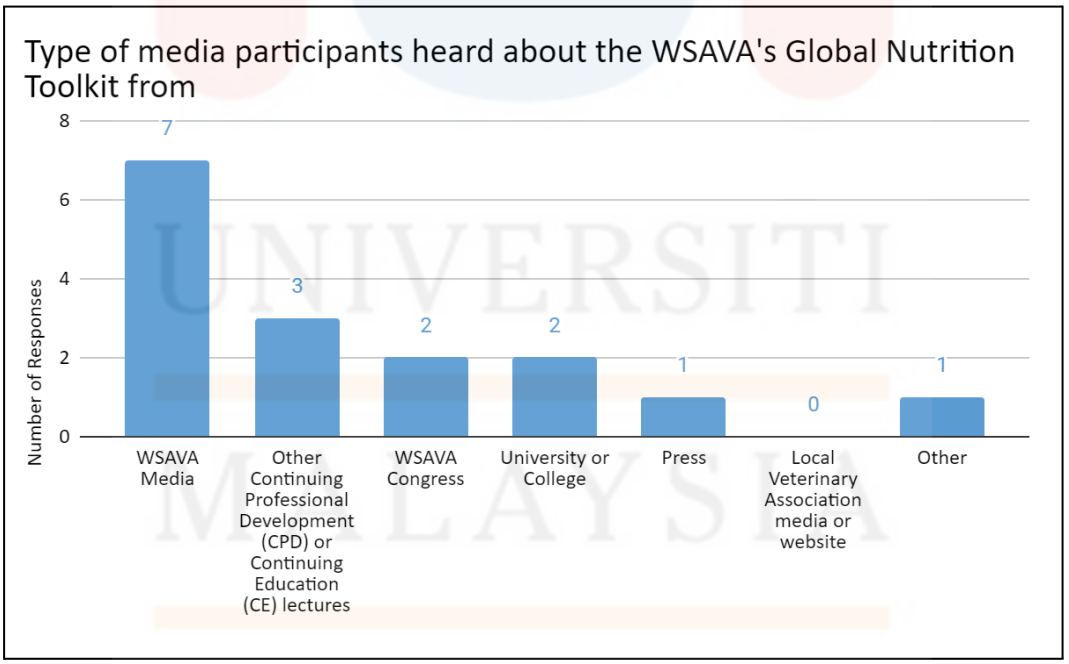

Figure 4.2.3 Total response from respondents (n= 10) on where they have heard of WSAVA's Global Nutrition Toolkit

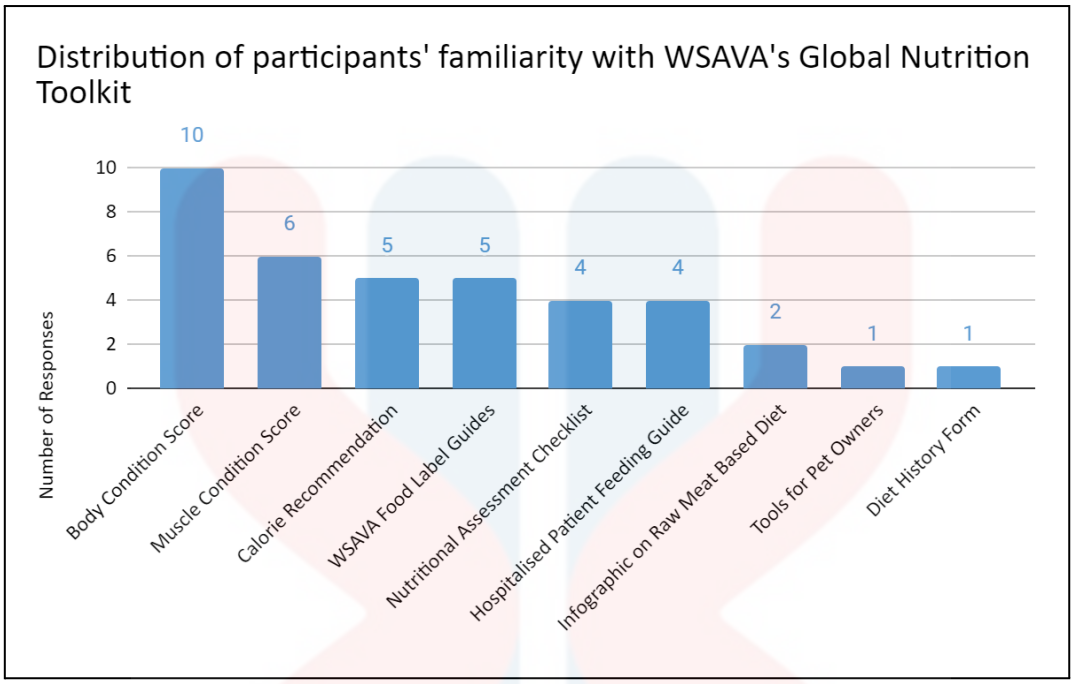

Figure 4.2.4 Total response from respondents (n = 10) on their familiarity with WSAVA's Global Nutrition Toolkit

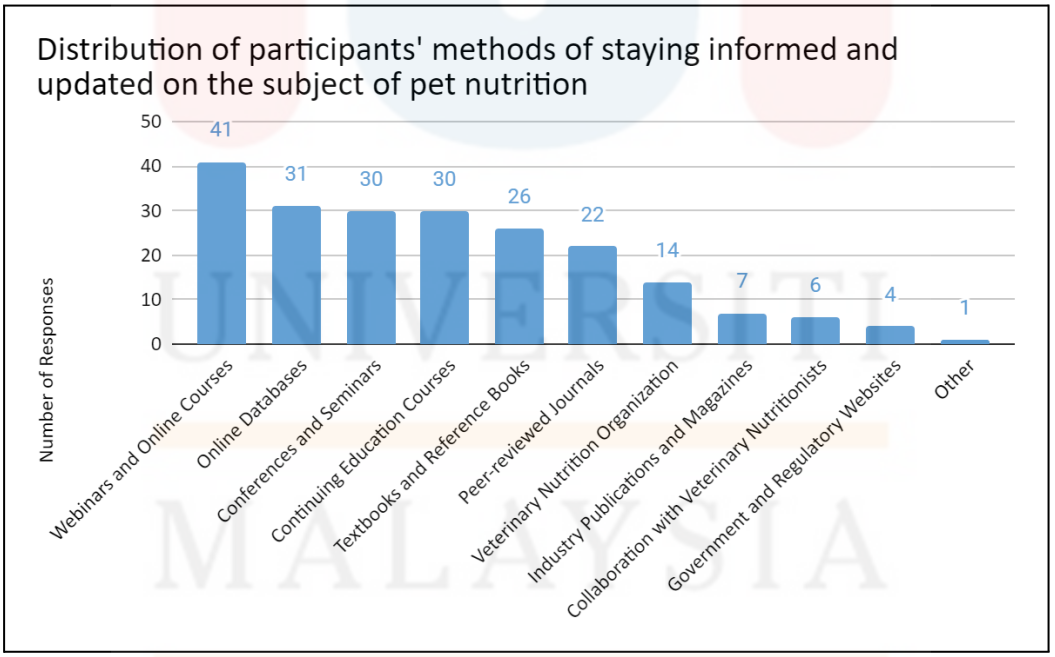

Figure 4.2.5 Total response from respondents (n = 50) on methods of staying informed and updated on the subject of pet nutrition

4.3 Attitude on nutrition among small animal veterinarians

Table 4.3 assesses the attitude of participating small animal veterinarians regarding nutrition. Majority of participants were extremely interested in nutrition related to therapeutic food (n = 22/50, 44%) as well as somewhat interested in nutrition related to non-therapeutic food (n = 18/50, 36%). Despite that, the amount of time spent by the majority of participants in researching on the subject of nutrition for therapeutic food (n = 21/50, 42%) and non-therapeutic food (n = 22/50, 44%) was less than an hour. When asked about the confidence level of participants in their knowledge surrounding nutrition when advising clients, the majority stated that they are moderately confident on the subject of therapeutic food nutrition (n = 22/50, 44%) and non-therapeutic food nutrition (n = 20/50, 40%).

Table 4.3 Attitude on nutrition among small animal veterinarians (*n*= 50)

Attitude-based items	**Total Scale (*n* = 50)**									
	Not interested		**A little interested**		**Somewhat interested**		**Very interested**		**Extremely interested**	
	n	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Q1-2: How interested are you in nutrition related to therapeutic food and non-therapeutic food?										
Therapeutic Food	0	-	0	-	13	26	15	30	**22**	**44**
Non-therapeutic Food	1	2	4	8	**18**	**36**	14	28	13	26

Attitude-based items	**Total Scale (*n* = 50)**									
	Never		**Less than 1 hour**		**1 to 5 hours**		**6 to 10 hours**		**More than 10 hours**	
	n	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Q3-4: On average, how much time do you spend researching or looking up therapeutic food and non-therapeutic food per month?										
Therapeutic Food	1	2	**21**	**42**	15	30	11	22	2	4

Non-therapeutic Food	7	14	**22**	**44**	16	32	5	10	0	-

Attitude-based items	**Total Scale (*n* = 50)**									
	Not at all confident		**Slightly confident**		**Moderately confident**		**Very confident**		**Extremely confident**	
	n	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Q5-6: When discussing nutrition with clients, how much confidence do you have in your own nutritional knowledge of therapeutic food and of non-therapeutic food?										
Therapeutic Food	2	4	14	28	**22**	**44**	10	20	2	4
Non-therapeutic Food	5	10	19	38	**20**	**40**	6	12	0	-

4.4 Practice surrounding nutrition among small animal veterinarian

Table 4.4 assesses common practice by small animal veterinarians on the subject of nutrition. Majority of participants only carry out any form of nutritional assessment as part of the routine assessment of a patient for only at least 25% of their overall consultations (n = 14/50, 28%).

When admitting a patient, majority participants always inquire about a patient's type of diet (n = 18/50, 36%) and food allergies or sensitivities (n = 16/50, 32%). Majority participants also inquire at least 75% of overall consults for meal timings (n = 16/50, 32%), treats or snacks (n = 14/50, 28%), and food changes (n = 16/50, 32%). Participants only inquire for at least 50% of overall consults for patient's flavour preference (n = 12/50, 24%), mealtime behaviour (n = 13/50, 26%), and vitamin and supplement usage (n = 14/50, 28%). Majority participants also inquire for at least 25% of overall consults regarding their patient's portion sizes (n = 15/50, 30%) and never inquire about the bowls or dish used (n = 14/50, 28%).

When asked about the frequency of which they provide nutritional recommendations, majority participants always provide them for sick patient visits (n = 21/50, 42%), while only providing nutritional recommendation for routine check-ups or healthy patient visits for at least 50% of their overall consultation (n = 18/50, 36%).

Table 4.4 Practice surrounding nutrition among small animal veterinarian *(n=50)*

Practice-based items	Total Scale (*n* = 50)											
	No, Never		*		At least 25% of overall consults		At least 50% of overall consults		At least 75% of overall consults		Yes, always	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Q1: Does your practice carry out any form of nutritional assessment as part of the routine assessment of patients' general health status?	8	19	13	26	**14**	**28**	9	18	4	8	2	4

* Only for patients who are sick, overweight, or believed to be malnourished or at risk of malnourishment

Practice-based items	Total Scale (*n* = 50)									
	No, Never		At least 25% of overall consults		At least 50% of overall consults		At least 75% of overall consults		Yes, always	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Q1: How often do you provide nutritional recommendations during a sick pet visit and during a healthy pet visit?										
Sick pet visit	1	2	4	8	10	20	14	28	**21**	**42**
Healthy pet visit	3	6	14	28	**18**	**36**	7	14	8	16

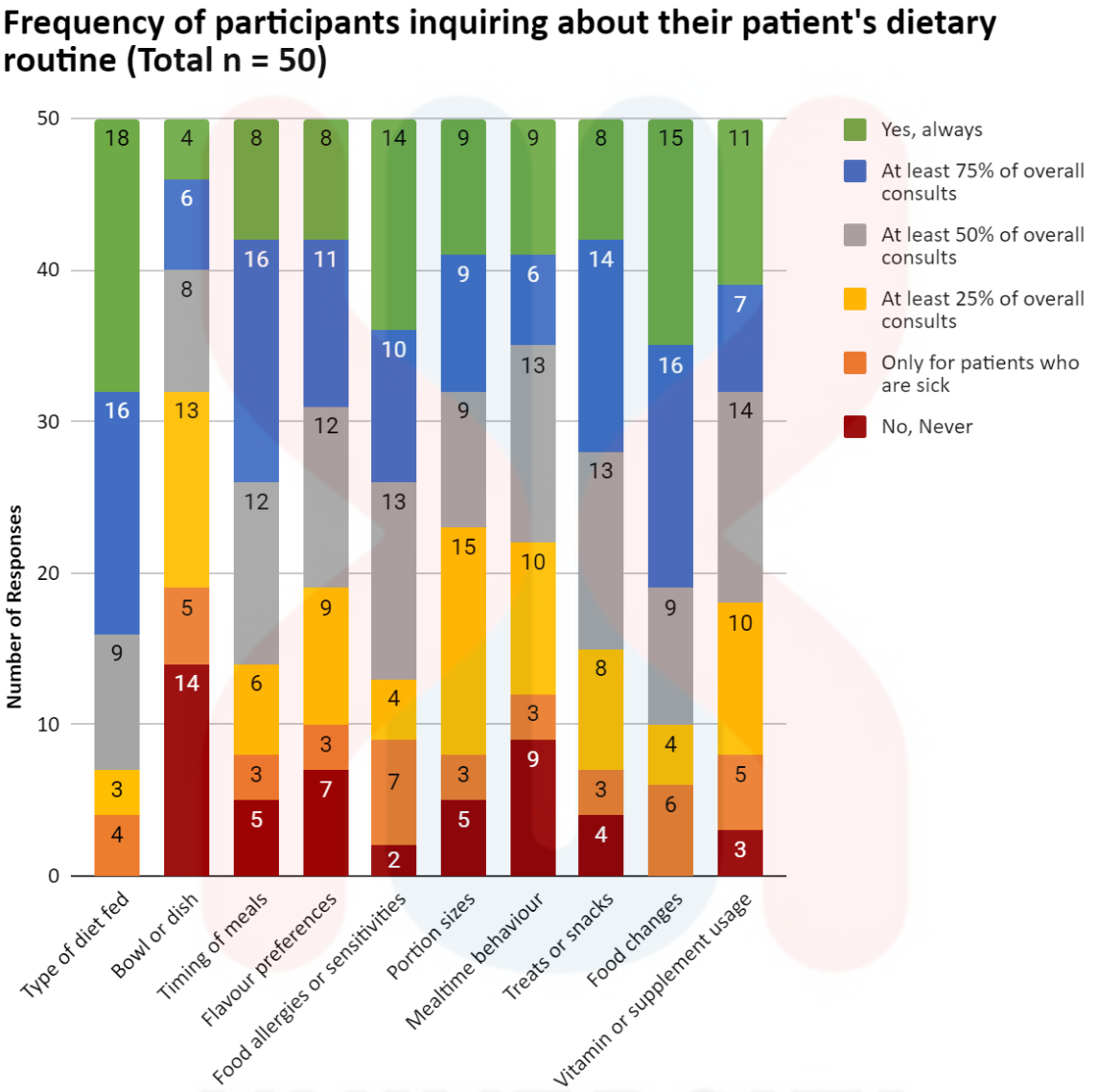

Figure 4.4.1 Total frequency of participants inquiring about patient's dietary routine

4.5 Participant's level of knowledge, attitude, and practice towards small animal nutrition

The data from these three domains were subject to descriptive analysis, presented through frequency and percentages. Table 4.5 illustrates three criteria indicating poor, moderate, and good levels of knowledge, attitude, and practices among respondents. The findings indicate that a majority of participants in this study possess a poor level of knowledge (n = 23/50, 46%), and moderate levels of attitude (n = 32/50, 64%), and practices (n = 27/50, 54%) toward small animal nutrition.

Table 4.5 Respondent's level of knowledge, attitude, and practice (KAP) towards nutrition

(n=50)

Variables	Level	Score	*n (%)*
Knowledge			
	Poor	0 – 5	**23 (46)**
	Moderate	6 – 10	19(38)
	Good	11 – 15	8 (16)
Attitude			
	Poor	0 – 10	0 (0)
	Moderate	11 – 20	**32 (64)**
	Good	21 – 30	18 (36)
Practice			
	Poor	0 – 27	2 (4)
	Moderate	28 – 55	**26 (52)**
	Good	56 – 83	22 (44)

4.6 Association between respondents' selected socio-demographic characteristics and Knowledge, Attitude, and Practice of small animal nutrition among veterinarians

Linear regression analysis was done for continuous data of the total scores that were transformed. In Table 4.6, the linear regression analysis revealed that, among the variables examined, age demonstrated the largest unique contribution to the participants' knowledge scores (β = 0.277). This suggests that, for each unit increase in age, we observe an estimated 0.277 increase in the knowledge score, after accounting for other variables such as gender, qualification level, years of experience, and so on. Furthermore, the variable of age has an almost statistically significant contribution (p= 0.052).

In Table 4.7, the linear regression analysis revealed that years of experience demonstrated the largest unique contribution to the participants' attitude scores (β = 0.150). This suggests that, for each unit increase in years of experience, we observe an estimated 0.150 increase in the attitude score.

In Table 4.8, the linear regression analysis revealed that the qualification level demonstrated the largest unique contribution to the participants' practice scores (β = 0.169). This suggests that, for each unit increase in qualification level, we observe an estimated 0.169 increase in the practice score.

There is no further statistical significance of the variables when comparing associations of the socio-demographic variables with attitude and practice scores.

Table 4.6 Association between selected socio-demographic characteristics and Knowledge of CKD in dogs and cats

Variables	Grades *n* (%)			Linear Regression (*beta value*)	*p*- value
	Poor	Moderate	Good		
Age				**-0.277**	**0.052**
18 – 25	3 (6)	5 (10)	5 (10)		
26 – 39	18 (36)	12 (24)	3 (6)		
40 - 59	2 (4)	2 (4)	-		
60 - 70	-	-	-		
>70	-	-	-		
Gender				0.022	0.878
Male	4 (8)	3 (6)	2 (4)		
Female	19 (38)	16 (32)	6 (12)		
Qualification level				-0.130	0.369
DVM (Doctor of Veterinary Medicine)	20 (40)	18 (36)	8 (16)		
MSc (Master of Science)	1 (2)	1 (2)	-		
MVSc (Master of Veterinary Science)	1 (2)	-	0		
PGDip (Postgraduate Diploma)	1 (2)	-	-		
Role / Occupation				0.039	0.788
Veterinarian in private sector/practice	19 (38)	14 (28)	7 (14)		
Veterinarian in public sector/practice	2 (4)	3 (6)	-		
Locum veterinarian	2 (4)	1 (2)	1 (2)		
Other (Pharmaceutical Veterinarian)	-	1 (2)	-		
Years of experience				-.040	0.782
Less than a year	6 (12)	2 (4)	5 (10)		
1 - 3 years	8 (16)	7 (14)	2 (4)		
4 - 6 years	3 (6)	2 (4)	-		
7 - 9 years	3 (6)	1 (2)	-		
≥ 10 years	3 (6)	7 (14)	1 (2)		

Variables	Grades *n* (%)			Linear Regression (*beta value*)	*p*- value
	Poor	Moderate	Good		
Types of practice				0.019	0.898
Animal Medical Center or Animal Hospital	4 (8)	2 (4)	-		
Felines only	3 (6)	2 (4)	1 (2)		
General practice	15 (30)	11 (22)	6 (12)		
General practice with emergency option	1 (2)	3 (6)	1 (2)		
Canines only	-	-	-		
Other (Pharmaceuticals and animal nutrition)	-	1 (2)	-		
Perceived level of formal education in companion animal nutrition				0.075	0.604
None	1 (2)	1 (2)	-		
Very little	5 (10)	6 (12)	1 (2)		
Some	9 (18)	8 16)	4 (8)		
Adequate	8 (16)	4 (8)	3 (6)		
A significant amount	-	-	-		

Table 4.7 Association between selected socio-demographic characteristics and Attitude towards nutrition among small animal veterinarians

Variables	Grades *n* (%)			Linear Regression (*beta value*)	*p*- value
	Poor	Moderate	Good		
Age				0.007	0.964
18 – 25	-	10 (20)	3 (6)		
26 – 39	-	18 (36)	15 (30)		
40 - 59	-	4 (8)	-		
60 - 70	-	-	-		
>70	-	-	-		
Gender				0.005	0.971
Male	-	6 (12)	3 (6)		
Female	-	26 (52)	15 (30)		

Variables	Grades *n* (%)			Linear Regression (*beta value*)	*p*- value
	Poor	Moderate	Good		
Qualification level				-0.090	0.536
DVM (Doctor of Veterinary Medicine)	-	29 (58)	17 (34)		
MSc (Master of Science)	-	2 (4)	-		
MVSc (Master of Veterinary Science)	-	1 (2)	-		
PGDip (Postgraduate Diploma)	-	-	1 (2)		
Role / Occupation				-0.002	0.987
Veterinarian in private sector/practice	-	25 (50)	15 (30)		
Veterinarian in public sector/practice	-	4 (8)	1 (2)		
Locum veterinarian	-	3 (6)	1 (2)		
Other (Pharmaceutical Veterinarian)	-	-	1(2)		
Years of experience				**0.150**	0.300
Less than a year	-	11 (22)	2 (4)		
1 - 3 years	-	9 (18)	8 (16)		
4 - 6 years	-	4 (8)	1 (2)		
7 - 9 years	-	3 (6)	1 (2)		
≥ 10 years	-	5 (10)	6 (12)		
Types of practice				0.050	0.732
Animal Medical Center or Animal Hospital	-	6 (12)	-		
Felines only	-	2 (4)	4 (8)		
General practice	-	22 (44)	10 (20)		
General practice with emergency option	-	2 (4)	3 (6)		
Canines only	-	-	-		
Other (Pharmaceuticals and animal nutrition)	-	-	1 (2)		

Variables	Grades *n* (%)			Linear Regression (*beta value*)	*p*- value
	Poor	Moderate	Good		
Perceived level of formal education in companion animal nutrition				-0.063	0.666
None	-	1 (2)	1 (2)		
Very little	-	7 (14)	5 (10)		
Some	-	15 (30	6 (12)		
Adequate	-	9 (18)	6 (12)		
A significant amount	-	-	-		

Table 4.8 Association between selected socio-demographic characteristics and Practise

Variables	Grades *n* (%)			Linear Regression (*beta value*)	*p*- value
	Poor	Moderate	Good		
Age				-0.054	0.710
18 – 25	1 (2)	6 (12)	6 (12)		
26 – 39	1 (2)	18 (36)	14 (28)		
40 - 59	-	2 (4)	2 (4)		
60 - 70	-	-	-		
>70	-	-	-		
Gender				-0.014	0.926
Male	2 (4)	2 (4)	5 (10)		
Female	-	24 (48)	17 (34)		
Qualification level				**-0.169**	0.240
DVM (Doctor of Veterinary Medicine)	2 (4)	23 (46)	21 (42)		
MSc (Master of Science)	-	2 (4)	-		
MVSc (Master of Veterinary Science)	-	1 (2)	-		
PGDip (Postgraduate Diploma)	-	-	1 (2)		

Variables	Grades *n* (%)			Linear Regression (*beta value*)	*p*- value
	Poor	Moderate	Good		
Role / Occupation				0.073	0.616
Veterinarian in private sector/practice	2 (4)	21 (42)	17 (34)		
Veterinarian in public sector/practice	-	3 (6)	2 (4)		
Locum veterinarian	-	2 (4)	2 (4)		
Other (Pharmaceutical Veterinarian)	-	-	1 (2)		
Years of experience				0.092	0.524
Less than a year	2 (4)	5 (10)	6 (12)		
1 - 3 years	-	9 (18)	8 (16)		
4 - 6 years	-	4 (8)	1 (2)		
7 - 9 years	-	3 (6)	1 (2)		
≥ 10 years	-	5 (10)	6 (12)		
Types of practice				0.082	0.572
Animal Medical Center or Animal Hospital	-	3 (6)	3 (6)		
Felines only	-	5 (10)	1 (2)		
General practice	1 (2)	18 (36)	13 (26)		
General practice with emergency option	1 (2)	-	4 (8)		
Canines only	-	-	-		
Other (Pharmaceuticals and animal nutrition)	-	-	1 (2)		
Perceived level of formal education in companion animal nutrition				**-0.124**	0.392
None	-	1 (2)	1 (2)		
Very little	-	5 (10)	7 (14)		
Some	2 (4)	11 (22)	8 (16)		
Adequate	-	9 (18)	6 (12)		
A significant amount	-	-	-		

4.7 Correlation between total knowledge, attitude, and practice scores of small animal nutrition among veterinarians

The relationships between Total Knowledge Scores (TKS), Total Attitude Scores (TAS) and Total Practice Scores (TPS) were investigated using a Pearson product moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality and linearity. TKS had a medium positive correlation with TAS (r=0.437) and a small positive correlation with TPS (r=0.272) while TAS had a medium positive correlation with TPS (r=0.360). It is statistically significant among the relationships of TKS and TAS (p=0.002) and TAS and TPS (p=0.010). Since all variables were positively correlated with one another, it can be inferred that a higher total score for one variable (for example, knowledge) would mean a higher total score for another variable (for example attitude or practice) with the majority of them having medium-level relationships.

Table 4.9 Correlation between total knowledge, attitude, and practice score

Pearson's Correlation Coefficients (*r*)	**TKS (*p*- value)**	**TAS (*p*- value)**	**TPS (*p*- value)**
TKS	1.000	0.437 (0.002*)	0.272 (0.056)
TAS	0.437 (0.002*)	1.000	0.360 (0.010*)
TPS	0.272(0.056)	0.360 (0.010*)	1.000

TKS: Total Knowledge score, TAS: Total Attitude score, TPS: Total Practice score (all scores have been transformed using bloom's formula)

*Correlation is statistically significant at $p<0.05$ level

4.8 Result interpretation

This study aimed to assess the knowledge, attitudes, and practices of small animal veterinarians of the Klang Valley regarding nutrition. The majority of participants were female veterinarians with a DVM qualification, practising in the private sector, particularly in general practice. The survey revealed that most respondents had 1 to 3 years of experience and a perceived moderate level of formal education in companion animal nutrition. This is consistent with a study that revealed the perception of many veterinary practitioners that their education in small-animal nutrition was insufficient (Becvarova et al., 2016). The study observed interesting patterns related to these demographic factors. Female veterinarians exhibited better attitudes, and age was identified as a significant contributor to knowledge scores. However, it is important to note that there is unequal participation in terms of gender in which there were far more female respondents (n=41/50, 82%) than male respondents (n=9/50, 18%). This contributes to a skewed result of female veterinarians exhibiting better attitudes. Based on the available references, the gender distribution among small animal veterinarians varies. For instance, a study in Austria found that female veterinarians were more likely to work in small animal practices (Hartnack et al., 2016). Similarly, a survey in Italy reported that the gender composition of the veterinary profession has undergone significant changes over the years, with a gradual increase in the number of female professionals. In certain countries, females now constitute the majority within the profession (Pozza et al., 2020). Thus, further analysis is needed to explore the nuanced relationships between gender, age, and other demographic factors with knowledge, attitudes, and practices with an increased sample size.

Regarding knowledge about small animal nutrition, participants demonstrated a generally high level of awareness of nutrition's importance as the fifth vital assessment (n=32/50, 64%). However, there was limited awareness of specific guidelines such as WSAVA's Nutritional Assessment Guidelines (n=30/50, 60%) and Global Nutrition Toolkit (n=40/50, 80%) in which the majority were unaware of their existence . This is supported by a study that revealed that

only 27% of respondents were aware of the WSAVA guidelines and that only 4% of veterinary healthcare teams consistently used WSAVA tools to perform a systematic nutritional assessment (Lumbis & Scally, 2020). The majority of participants kept themselves informed about nutrition through webinars, online courses, and conferences. These guidelines have also been integrated into various nutrition-related continuous education courses and are widely propagated via the WSAVA (Blees et al., 2021). The limited awareness of specific guidelines and toolkits like the WSAVA's Nutritional Assessment Guidelines and Global Nutrition Toolkit, underscores a potential gap in veterinarians' knowledge. One reason could be that based on the results, respondents who are aware of the WSAVA nutritional guidelines and GNC nutritional toolkit have heard of them by the majority through WSAVA media and other Continuing Professional Development (CPD) or Continuing Education (CE) lectures. This shows that other forms and ways of dissemination of the guidelines and toolkit can be done for increased awareness. One study emphasizes the importance of an interprofessional approach and the availability of non-branded support materials and practical aids in the WSAVA Global Nutrition Toolkit to enhance the implementation of nutritional assessment guidelines (Lumbis & Rinkinen, 2022). Addressing this gap through targeted educational initiatives could empower practitioners with valuable resources, ultimately enhancing the quality of nutritional advice provided.

Based on the references provided, it is evident that there is a significant relationship between the knowledge of small animal veterinarians in nutrition and their attitudes and practices. Veterinarians with more formal instruction and those who spent more time in self-education had increased confidence in their nutritional knowledge and that of their staff (Alvarez et al., 2023).

Regarding attitudes, participants expressed high interest in therapeutic food nutrition (n=22, 44%), although their confidence in advising clients on both therapeutic (n=22/50, 44%) and non-therapeutic (n=20/50, 44%) nutrition was generally moderate. One reason would be that veterinarians may feel overwhelmed or unfamiliar with the large number of over-the-counter pet

food options, leading to limited interest in nontherapeutic pet nutrition (Alvarez et al., 2022). One survey found that veterinarians discuss nutrition less during healthy pet appointments and are significantly less confident with their knowledge regarding non-therapeutic food, compared to therapeutic food (Alvarez et al., 2022). According to responses from Table 4.1 regarding level of formal education regarding nutrition, correspondents' perceived level of formal education in companion animal nutrition is Some (n = 21/50, 42%). This shows that the majority of respondents believe that not enough knowledge of veterinary nutrition was taught in veterinary school. This is supported by a survey of recent graduates in the United States which reported low levels of confidence in both large and small animal veterinary nutrition training by veterinary colleges (Morgan et al., 2017). Due to their perceived lack of formal education on the topic of nutrition, it would consequently affect the veterinarian's confidence on their knowledge of veterinary nutrition as a whole, both for therapeutic and non-therapeutic food. Hence, the lack of foundation and confidence may lead to a decreased interest in pursuing nutritional research as well. This could also explain why the time spent on researching nutrition of therapeutic food (n= 21/50, 42%) and non-therapeutic food (n=22/50, 44%) was typically less than an hour for most participants, as most do not understand the weight of nutrition in veterinary medicine. An in-depth analysis of the factors influencing veterinarians' confidence levels in providing nutritional advice is essential. Understanding which specific areas pose challenges to their confidence can inform targeted interventions.

In terms of practices, the study found that a significant proportion of participants conducted nutritional assessments in only a small percentage of overall consultations. While inquiries about diet type, food allergies, and sensitivities were common, other aspects, such as portion sizes and bowl types, were less frequently addressed. This can be inferred where the emphasis on inquiries about diet type, food allergies, and sensitivities suggests a predominant interest in diagnosing common issues, particularly those related to skin conditions. However, the comparatively lower frequency of addressing aspects such as portion sizes and bowl types

implies that these veterinarians may not prioritize or extensively explore other elements of nutrition, potentially concentrating more on prevalent concerns like skin-related problems. This is supported by studies that mention that the issue of food allergies in dogs and cats is a well-recognized concern in veterinary medicine. Diagnosing and managing adverse food reactions (AFRs) in these animals can manifest in a diverse array of clinical signs, including skin diseases (Hardy & Gajanayake, 2022). Cutaneous adverse food reactions (CAFR) represent one of the most common diagnoses given to dogs and cats with pruritus or allergic skin diseases (Olivry & Bexley, 2018). Nutritional recommendations were always provided during sick patient visits (n=21/50, 42%) while only 50% of healthy pet visit consults get nutritional recommendations (n=18/50, 36%). This implies that veterinarians may perceive a greater need for and importance of nutritional guidance when addressing health issues or concerns in sick patients, prioritising nutritional interventions during these specific contexts. This suggests a potential gap in addressing the nutritional needs of healthy pets. This discrepancy may indeed raise concerns about the potential implications for the health of pets in terms of maintaining a balanced diet and preventing issues like obesity. The lower frequency of nutritional recommendations during routine check-ups for healthy pets might indicate a missed opportunity for preventive care. Lack of proactive nutritional guidance for healthy pets could contribute to the risk of obesity and other diet-related health issues. This is supported by studies that show that despite the recognition of the professional responsibility of veterinarians in preventing and treating pet obesity, concerns have been raised about the inconsistency in identifying and discussing pet obesity with clients (Sutherland et al., 2022).

The data indicated that most participants possessed a moderate level of knowledge, attitude, and practices toward small animal nutrition. A linear regression analysis identified age as the variable demonstrating the largest unique contribution to knowledge scores, while years of experience had the largest unique contribution to attitude scores. For knowledge, older veterinarians may have accumulated more years of experience and exposure to diverse cases,

contributing to a broader knowledge base in small animal nutrition. This is shown where a significantly greater proportion of veterinarians with more than 25 years of experience reported higher levels of confidence in their knowledge about therapeutic food compared to those with 10 years or less of experience (Alvarez et al., 2022). Furthermore, a US survey demonstrated that as veterinarians age, their willingness to comply with client's wishes increased relative to the interests of patients (Kipperman et al., 2018).

As for attitude, veterinarians with more years of experience may have encountered a variety of cases, influencing their attitudes toward small animal nutrition through practical exposure. Furthermore, longer professional experience could result in a more adaptive and open attitude toward incorporating nutritional considerations into overall veterinary practices (Alvarez et al., 2022.

Lastly, qualification level was the largest unique contribution to practise scores. Higher qualification levels may signify a more extensive educational foundation, providing veterinarians with the necessary knowledge and skills to implement best practices in small animal nutrition. For instance, a study on the application of veterinary naturopathy and complementary medicine in small animal medicine found that veterinarians with advanced training acknowledged by the Academy for Veterinary Continuing Education were more likely to incorporate these alternative practices into their treatment modalities (Stanossek & Wehrend, 2022). Veterinarians with advanced qualifications might be more adept at integrating nutritional considerations into their clinical decision-making processes, influencing their practices.

The correlation analysis revealed positive relationships between total knowledge, attitude, and practice scores. The statistically significant relationships between total knowledge and attitude scores, as well as attitude and practice scores, suggested that fostering higher knowledge levels among veterinarians could contribute not only to positive attitudes but also to the implementation of sound practices in small animal nutrition. The overarching positive

relationships among knowledge, attitude, and practice scores suggest a cohesive alignment. Veterinarians who excel in one aspect like knowledge, tend to also demonstrate strength in the others which are attitude and practices. This interconnectedness underscores the importance of a holistic approach, where a well-rounded understanding of small animal nutrition contributes to positive attitudes and effective implementation of best practices (Lumbis & Rinkinen, 2022). Also, the statistically significant relationships highlight the robustness and reliability of the observed associations. The findings suggest that the identified positive correlations are not likely due to chance and provide meaningful insights into the interconnected nature of knowledge, attitude, and practices in small animal nutrition.

The study encountered several limitations that warrant consideration in interpreting the findings. First and foremost, the anticipated sample size was 132 participants; however, only 50 veterinarians responded to the survey. This limited sample size may impact the generalizability of the results to the broader population of small animal veterinarians in the Klang Valley. The survey design was modeled after another international study by WSAVA GNC which partnered with Clinician's Brief, WSAVA's official practice journal, which introduced an element of dependency on the original survey's construct validity and reliability. While this approach facilitated comparison, it also carries the risk of inheriting any limitations present in the original instrument. Furthermore, it also carried an aspect of a foreign opinion and was not locally catered to the local study population. Data collection posed challenges as reaching veterinarians proved difficult within the limited one-month timeframe allocated for the study. Utilising only Microsoft Forms for data collection may have further constrained participation, as veterinarians might have faced time constraints or other commitments. Additionally, external factors, such as a lack of comprehensive contact lists for small animal veterinarians and difficulty quantifying their exact numbers, contributed to the challenges in obtaining a representative sample. Furthermore, data had to be transformed due to non-normality, introducing a potential source of bias. The transformation, carried out using Bloom's formula, may have influenced the statistical

outcomes. Additionally, the lack of significant associations between sociodemographic variables and total scores raises questions about the robustness of the study's predictive models.

CHAPTER 5

CONCLUSION

In summary, this study provides insights into the current state of knowledge, attitudes, and practices of small animal veterinarians regarding nutrition. The findings suggest areas for improvement, such as enhancing awareness of specific guidelines and increasing the frequency of nutritional assessments during consultations. The positive correlations between knowledge, attitude, and practice scores emphasise the importance of continuous education and training in promoting optimal nutritional care for small animals. The limitations encompassed a smaller-than-anticipated sample size, dependencies on an existing survey design, challenges in reaching and engaging veterinarians, and the need for data transformation.

REFERENCES

Alvarez, E. E., Schultz, K. K., Floerchinger, A. M., & Hull, J. L. (2022). *Small animal general practitioners discuss nutrition infrequently despite assertion of indication, citing barriers*. Journal of the American Veterinary Medical Association, 260(13), 1704–1710. https://doi.org/10.2460/javma.22.05.0226

Archer, J. (2019). *Effect of renoprotective amino acids and a dipeptide on disease progression, nutritional status, and blood-serum phosphate concentration in cats with chronic kidney disease*. Research Journal for Veterinary Practitioners, 7(2). https://doi.org/10.17582/journal.rjvp/2019/7.2.39.52

Baldwin, K., Bartges, J., Buffington, T., Freeman, L. M., Grabow, M., Legred, J., & Ostwald, D. (2010). *AAHA Nutritional Assessment Guidelines for dogs and cats.* Journal of the American Animal Hospital Association, 46(4), 285–296. https://doi.org/10.5326/0460285

Bard, A., Main, D., Haase, A., Whay, H., Roe, E., & Reyher, K. (2017). *The future of veterinary communication: partnership or persuasion? a qualitative investigation of veterinary communication in the pursuit of client behaviour change*. Plos One, 12(3), e0171380. https://doi.org/10.1371/journal.pone.0171380

Blees, N. R., Vandendriessche, V. L., Corbee, R. J., Picavet, P., & Hesta, M. (2021). *Nutritional consulting in regular veterinary practices in Belgium and the Netherlands*. Veterinary Medicine and Science, 8(1), 52–68. https://doi.org/10.1002/vms3.679

Becvarova, I., Prochazka, D., Chandler, M., & Meyer, H. (2016). *Nutrition education in European veterinary schools: Are European veterinary graduates competent in nutrition?*. Journal of Veterinary Medical Education, 43(4), 349-358. https://doi.org/10.3138/jvme.0715-122r1

Bizikova, P. and Olivry, T. (2016). *A randomised, double‐blinded crossover trial testing the benefit of two hydrolysed poultry‐based commercial diets for dogs with spontaneous pruritic chicken allergy.* Veterinary Dermatology, 27(4), 289. https://doi.org/10.1111/vde.12302

Buff, P., Carter, R., Bauer, J., & Kersey, J. (2014). *Natural pet food: a review of natural diets and their impact on canine and feline physiology*. Journal of Animal Science, 92(9), 3781-3791. https://doi.org/10.2527/jas.2014-7789

Butterwick, R. (2015). *Impact of nutrition on ageing the process. Bridging the gap: the animal perspective*. British Journal of Nutrition, 113(S1), S23-S25. https://doi.org/10.1017/s0007114514003900dia

Chan, D. L., & Freeman, L. M. (2006). *Nutrition in critical illness*. Veterinary Clinics of North America: Small Animal Practice, 36(6), 1225–1241. https://doi.org/10.1016/j.cvsm.2006.08.009

Chandler, M. L., & Takashima, G. (2014). *Nutritional concepts for the veterinary practitioner*. Veterinary Clinics of North America: Small Animal Practice, 44(4), 645–666. https://doi.org/10.1016/j.cvsm.2014.03.009

Chandler, M. L., & Gunn-Moore, D. A. (2004). *Nutritional status of canine and feline patients admitted to a referral veterinary internal medicine service*. The Journal of Nutrition, 134(8). https://doi.org/10.1093/jn/134.8.2050s

Davies, M. (2016). *Veterinary clinical nutrition: Success stories: An overview*. Proceedings of the Nutrition Society, 75(3), 392–397. https://doi.org/10.1017/s002966511600029x

Fantinati, M., Dufayet, R., Rouch‐Buck, P., & Priymenko, N. (2021). *Relationship between a plant‐based 'vegan' pet food and clinical manifestation of multiple nutrient deficiencies in two cats*. Journal of Animal Physiology and Animal Nutrition, 105(6), 1179–1191. https://doi.org/10.1111/jpn.13510

Fascetti, A. and Delaney, S. (2012). *Applied veterinary clinical nutrition*. https://doi.org/10.1002/9781118785669

Freeman, L., Becvarova, I., Cave, N., MacKay, C., Nguyen, P., Rama, B., Takashima, G., Tiffin, R., Tsjimoto, H., & van Beukelen, P. (2011). *WSAVA Nutritional Assessment Guidelines.* Journal of Small Animal Practice, 52(7), 385–396. https://doi.org/10.1111/j.1748-5827.2011.01079.x

Freeman, L. M. (2015). *New tools for the Nutritional Assessment and management of critical care patients*. Journal of Veterinary Emergency and Critical Care, 25(1), 4–5. https://doi.org/10.1111/vec.12277

German, A. J. (2010). *Obesity in companion animals*. In Practice, 32(2), 42-50. https://doi.org/10.1136/inp.b5665

Gerstner, K. and Liesegang, A. (2020). *How do Swiss dog owners visiting a dog exhibition understand feed labels?*. Journal of Animal Physiology and Animal Nutrition, 105(S2), 37-41. https://doi.org/10.1111/jpn.13322

Gugliandolo, E., Peritore, A., Piras, C., Cuzzocrea, S., & Crupi, R. (2020). *Palmitoylethanolamide and related aliamides: prohomeostatic lipid compounds for animal health and wellbeing*. Veterinary Sciences, 7(2), 78. https://doi.org/10.3390/vetsci7020078

Hardy, J. and Gajanayake, I. (2022). *Diagnosis and management of adverse food reactions in dogs and cats*. In Practice, 44(4), 196-203. https://doi.org/10.1002/inpr.197

Ismail, Rosnah. (2020). Occupational Injuries and Zoonotic Disease among Small Animal Veterinarians in Klang Valley, Malaysia. *International Journal of Public Health and Clinical Sciences*. 6. 78-88. https://doi.org/10.32827/ijphcs.6.6.78

Ito, Y., Ishikawa, H., Suzuki, A., & Kato, M. (2022). *The relationship between evaluation of shared decision-making by pet owners and veterinarians and satisfaction with veterinary consultations.* BMC Veterinary Research, 18(1). https://doi.org/10.1186/s12917-022-03401-6

Janke, N., Coe, J., Sutherland, K., Bernardo, T., Dewey, C., & Stone, E. (2021). *Evaluating shared decision‐making between companion animal veterinarians and their clients using the observer OPTION5 instrument*. Veterinary Record, 189(8). https://doi.org/10.1002/vetr.778

Kamleh, M., Khosa, D., Verbrugghe, A., Dewey, C., & Stone, E. (2020). *A cross-sectional study of pet owners' attitudes and intentions towards nutritional guidance received from veterinarians.* Veterinary Record, 187(12), e123-e123. https://doi.org/10.1136/vr.105604

Kathrani, A., Allenspach, K., Fascetti, A., Larsen, J., & Hall, E. (2018). *Alterations in serum amino acid concentrations in dogs with protein‐losing enteropathy*. Journal of Veterinary Internal Medicine, 32(3), 1026-1032. https://doi.org/10.1111/jvim.15116

Korman, R. and White, J. (2013). *Feline CKD*. Journal of Feline Medicine and Surgery, 15(1_suppl), 29-44. https://doi.org/10.1177/1098612x13495241

Küper, A. and Merle, R. (2019). *Being nice is not enough-exploring relationship-centred veterinary care with structural equation modelling. a quantitative study on German pet owners' perception*. Frontiers in Veterinary Science, 6. https://doi.org/10.3389/fvets.2019.00056

Lemke, R., Burkholder, W., Conway, C., Lando, A., & Valcin, S. (2015). *An analysis of pet food label usage*. Journal of Consumer Affairs, 49(3), 627-638. https://doi.org/10.1111/joca.12076

Lumbis, R. H., & de Scally, M. (2020). *Knowledge, attitudes and application of nutrition assessments by the veterinary health care team in small animal practice*. Journal of Small Animal Practice, 61(8), 494–503. https://doi.org/10.1111/jsap.13182

Lumbis, R. and Rinkinen, M. (2022). *Veterinary nutritional assessment: the importance of an interprofessional approach*. The Veterinary Nurse, 13(5), 214-219. https://doi.org/10.12968/vetn.2022.13.5.214

Roudebush, P., Allen, T. A., Dodd, C. E., & Novotny, B. J. (2004). *Application of evidence-based medicine to Veterinary Clinical Nutrition*. Journal of the American Veterinary Medical Association, 224(11), 1766–1771. https://doi.org/10.2460/javma.2004.224.1766

MacKay, C. (2011). *Nutrition — the '5th vital assessment'*. Journal of Feline Medicine and Surgery, 13(7), 484–484. https://doi.org/10.1016/j.jfms.2011.05.003

MacMartin, C., Wheat, H., Coe, J., & Adams, C. (2018). *Conversation analysis of veterinarians' proposals for long-term dietary change in companion animal practice in Ontario, Canada*. Journal of Veterinary Medical Education, 45(4), 514-533. https://doi.org/10.3138/jvme.0317-034r

Mansilla, W., Marinangeli, C., Ekenstedt, K., Larsen, J., Aldrich, G., Columbus, D., Weber, L., Abood, S. K., & Shoveller, A. K. (2019). *Special topic: the association between pulse ingredients and canine dilated cardiomyopathy: addressing the knowledge gaps before establishing causation*. Journal of Animal Science, 97(3), 983-997. https://doi.org/10.1093/jas/sky488

Morgan, S., Willis, S., & Shepherd, M. (2017). *Survey of owner motivations and veterinary input of owners feeding diets containing raw animal products*. Peerj, 5, e3031. https://doi.org/10.7717/peerj.3031

Olivry, T. and Bexley, J. (2018). *Cornstarch is less allergenic than corn flour in dogs and cats previously sensitised to corn.* BMC Veterinary Research, 14(1). https://doi.org/10.1186/s12917-018-1538-5

Olivry, T., Bexley, J., & Mougeot, I. (2017). *Extensive protein hydrolyzation is indispensable to prevent ige-mediated poultry allergen recognition in dogs and cats*. BMC Veterinary Research, 13(1). https://doi.org/10.1186/s12917-017-1183-4

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. ALLEN & UNWIN.

Park, R., Gruen, M., & Royal, K. (2021). *Association between dog owner demographics and decision to seek veterinary care*. Veterinary Sciences, 8(1), 7. https://doi.org/10.3390/vetsci8010007

Petersen, K., Flock, M., Richter, C., Mukherjea, R., Slavin, J., & Kris-Etherton, P. (2017). *Healthy dietary patterns for preventing cardiometabolic disease: the role of plant-based*

foods and animal products. Current Developments in Nutrition, 1(12), cdn.117.001289. https://doi.org/10.3945/cdn.117.001289

Phillips, A. M., Coe, J. B., Rock, M., & Adams, C. L. (2017). *Feline obesity in veterinary medicine: insights from a thematic analysis of communication in practice.* Frontiers in Veterinary Science, 4. https://doi.org/10.3389/fvets.2017.00117

Prata, J. (2022). *Survey of pet owner attitudes on diet choices and feeding practices for their pets in Portugal*. Animals, 12(20), 2775. https://doi.org/10.3390/ani12202775

Rollins, A. and Murphy, M. (2019). *Nutritional assessment in the cat: practical recommendations for better medical care*. Journal of Feline Medicine and Surgery, 21(5), 442-448. https://doi.org/10.1177/1098612x19843213

Roudebush, P., Polzin, D., Ross, S., Towell, T., Adams, L., & Forrester, S. (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

Stanossek, I. and Wehrend, A. (2022). Application of veterinary naturopathy and complementary medicine in small animal medicine—a survey among German veterinary practitioners. Plos One, 17(2), e0264022. https://doi.org/10.1371/journal.pone.0264022

Summers, S., Stockman, J., Larsen, J., Rodriguez, A., & Zhang, L. (2020). *Evaluation of nutrient content and caloric density in commercially available foods formulated for senior cats*. Journal of Veterinary Internal Medicine, 34(5), 2029-2035. https://doi.org/10.1111/jvim.15858

Sutherland, K., Coe, J., & O'Sullivan, T. (2022). *Exploring veterinary professionals' perceptions of pet weight‐related communication in companion animal veterinary practice.* Veterinary Record, 192(4). https://doi.org/10.1002/vetr.1973

Vinassa, M., Vergnano, D., Valle, E., Giribaldi, M., Nery, J., Prola, L., Bergero, D., & Schiavone, A. (2019). *Profiling Italian cat and dog owners' perception of pet food quality in purchasing habits*. https://doi.org/10.21203/rs.2.18169/v1

Vinué, Á., Herrero-Cervera, A., & González-Navarro, H. (2018). *Understanding the impact of dietary cholesterol on chronic metabolic diseases through studies in rodent models*. Nutrients, 10(7), 939. https://doi.org/10.3390/nu10070939

Wallis, L., Radford, A., Belshaw, Z., Jackson, J., Kubinyi, E., German, A. J., & Westgarth, C. (2023). *"Just old age" – A qualitative investigation of owner and veterinary professional experiences of and attitudes to ageing in dogs in the UK*. Journal of Small Animal Practice, 64(7), 425-433. https://doi.org/10.1111/jsap.13610

Weemhoff, J., MacLeay, J., Brejda, J., Schiefelbein, H., Wernimont, S., & Gross, K. (2021). *Successful nutritional control of scratching and clinical signs associated with adverse food reaction: a randomised controlled coscad'18 adherent clinical trial in dogs in the United Kingdom*. Journal of Veterinary Internal Medicine, 35(4), 1893-1901. https://doi.org/10.1111/jvim.16192

Wernimont, S., Radosevich, J., Jackson, M., Ephraim, E., Badri, D., MacLeay, J. M., Jeweell, D. E., & Suchodolski, J. S. (2020). *The effects of nutrition on the gastrointestinal microbiome of cats and dogs: impact on health and disease.* Frontiers in Microbiology, 11. https://doi.org/10.3389/fmicb.2020.01266

APPENDICES

APPENDIX A

KNOWLEDGE

Case Processing Summary

		N	%
Cases	Valid	50	100.0
	Excluded[a]	0	.0
	Total	50	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.509	4

ATTITUDE

Case Processing Summary

		N	%
Cases	Valid	50	100.0
	Excluded[a]	0	.0
	Total	50	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.795	6

PRACTICE

Case Processing Summary

		N	%
Cases	Valid	50	100.0
	Excluded[a]	0	.0
	Total	50	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.902	13

Cronbach's Alpha of Knowledge, Attitude and Practice respectively. If there are less than 10 tems on the scale, it is difficult to achieve an alpha value of more than 0.7 and thus items that are less than 10 should achieve an alpha value of more than 0.5 for adequate reliability (Pallant, 2020).

APPENDIX B

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Normal Score of TOTAL_K2 using Blom's Formula	.106	50	.200*	.977	50	.445
Normal Score of TOTAL_A using Blom's Formula	.100	50	.200*	.976	50	.393
Normal Score of TOTAL_P using Blom's Formula	.043	50	.200*	.994	50	.996

*. This is a lower bound of the true significance.

The normal scores (using Bloom's formula) were employed in SPSS to transform the data and achieve a more normal distribution. “Total_K2”, “Total_A” and “Total_P” being Total Knowledge Scores, Total Attitude Scores and Total Practice Scores respectively.

APPENDIX C

KAP OF NUTRITIONAL ASSESSMENTS AMONG SMALL ANIMAL VETS WITHIN KLANG VALLEY, MALAYSIA

Knowledge, attitude and practice of nutritional assessments among small animal/companion animal veterinarians within Klang Valley, Malaysia

Dear respondent,

My name is Cheah Sook Peng, Candace and I am a final year veterinary student from the Faculty of Veterinary Medicine, Universiti Malaysia Kelantan. The purpose of my study in this final year project research is to assess the "*knowledge, attitude and practice of nutritional assessments among small animal/companion animal veterinarians within Klang Valley, Malaysia*".

The questionnaire will take approximately 6 minutes to answer all the questions.

ALL INFORMATION COLLECTED THROUGH THIS SURVEY WILL BE KEPT CONFIDENTIAL AND IS ONLY USED FOR THIS KAP STUDY.

Your input and assistance in this survey is very greatly appreciated. Thank you.

Responden yang dihormati,

Nama saya Cheah Sook Peng, Candace dan saya merupakan pelajar veterinar tahun akhir dari Fakulti Perubatan Veterinar, Universiti Malaysia Kelantan. Tujuan kajian saya dalam penyelidikan projek tahun akhir ini adalah untuk menilai "pengetahuan, sikap dan amalan penilaian nutrisi dalam kalangan veterinar haiwan kesayangan di Lembah Klang, Malaysia".

Soal selidik ini akan mengambil masa lebih kurang 6 minit untuk dijawab.

SEGALA MAKLUMAT YANG DIKUMPUL MELALUI KAJIAN INI ADALAH SULIT DAN HANYA DIGUNAKAN UNTUK KAJIAN INI.

Kerjasama anda dalam tinjauan ini amat kami hargai. Terima kasih.

CONSENT FORM / BORANG PERSETUJUAN

1. I do understand the purpose of the survey and agree to participate in this study.
   Saya memahami tujuan tinjauan dan bersetuju untuk mengambil bahagian dalam kajian ini

- ◯ Yes, I agree / *Ya, saya setuju*
- ◯ No, I disagree/ *Saya tidak setuju*

Page 1 of 6

KAP OF NUTRITIONAL ASSESSMENTS AMONG SMALL ANIMAL VETS WITHIN KLANG VALLEY, MALAYSIA

SECTION A: SOCIO-DEMOGRAPHIC

2. Gender / *Jantina*

- ◯ Male / *Lelaki*
- ◯ Female / *Perempuan*

3. Age (year) / *Umur*

- ◯ 18 - 25
- ◯ 26 - 39
- ◯ 40 - 59
- ◯ 60 - 70
- ◯ > 70

4. Please identify your highest level of qualification
Sila kenal pasti kelayakan anda

- ◯ DVM (Doctor of Veterinary Medicine) / *(Doktor Perubatan Veterinar)*

- ◯ MSc (Master of Science) / *(Sarjana Sains)*
- ◯ MVSc (Master of Veterinary Science) / *(Sarjana Sains Veterinar)*
- ◯ PhD (Doctor of Philosophy) / *(Doktor Falsafah)*
- ◯ PGDip (Postgraduate Diploma) / *(Diploma Pascasiswazah)*
- ◯ Veterinary Diplomate / *(Ahli Kolej Veterinar)*
- ◯ Other

5. Please identify your role
   Sila kenal pasti peranan anda

- ◯ Veterinarian in private practice / *Doktor veterinar dalam amalan swasta*
- ◯ Veterinarian in public sector/practice / *Doktor veterinar dalam sektor/amalan awam*
- ◯ Locum veterinarian / *Doktor veterinar lokum*
- ◯ Other

6. Please identify for how long have you been in practice?
   Sila kenal pasti berapa lama anda telah berkerja?

- ◯ Less than a year / *Kurang daripada setahun*
- ◯ 1 - 3 years / *1-3 tahun*
- ◯ 4 - 6 years / *4-6 tahun*
- ◯ 7 - 9 years / *7-9 tahun*
- ◯ ≥ 10 years / *Sama dengan atau lebih daripada 10 tahun*

7. Which of the following best describes your practice?
Antara berikut, yang manakah menerangkan amalan klinik veterinar anda?

- ◯ General practice / *Amalan am*
- ◯ General practice with emergency option / *Amalan am dengan servis kecemasan*
- ◯ Animal Medical Center or Animal Hospital / *Pusat perubatan haiwan atau hospital haiwan*
- ◯ Felines only / *Kucing sahaja*
- ◯ Canines only / *Anjing sahaja*
- ◯ Other

8. How would you describe the amount of formal education in companion animal nutrition you received during your undergraduate veterinary education?
Bagaimanakah anda menerangkan jumlah pendidikan formal dalam nutrisi haiwan kesayangan yang anda telah terima semasa pendidikan prasiswazah veterinar?

- ◯ 1- None / *Tiada*
- ◯ 2- Very little / *Sangat sedikit*
- ◯ 3- Some / *Sedikit*
- ◯ 4- Adequate / *Mecukupi*
- ◯ 5- A significant amount / *Jumlah yang besar*

Page 2 of 6

Microsoft 365

KAP OF NUTRITIONAL ASSESSMENTS AMONG SMALL ANIMAL VETS WITHIN KLANG VALLEY, MALAYSIA

SECTION B: KNOWLEDGE ABOUT NUTRITIONAL ASSESSMENTS AMONG VETERINARIANS

9. As part of your current job role, do you provide small animal nutrition-related education and/or advice to others (i.e. pet owners, veterinary staff, students) *Adakah anda memberikan pendidikan dan/atau nasihat tentang pemakanan haiwan kesayangan kepada orang lain (iaitu pemilik haiwan kesayangan, kakitangan veterinar, pelajar veterinar)*

- (●) Yes / *Ya*
- ( ) No / *Tidak*

10. Please state to whom you provide small animal nutrition-related education. *Sila nyatakan kepada siapa anda memberikan pendidikan berkaitan nutrisi haiwan.*

- [ ] Pet owners / *Pemilik haiwan peliharaan*
- [ ] Veterinary staff / *Staf veterinar*
- [ ] Veterinary students / *Pelajar veterinar*
- [ ] Pet food companies / *Syarikat makanan haiwan kesayangan*
- [ ] Pet store employees / *Kakitangan kedai haiwan kesayangan*

KAP OF NUTRITIONAL ASSESSMENTS AMONG SMALL ANIMAL VETS WITHIN KLANG VALLEY, MALAYSIA

SECTION B: KNOWLEDGE ABOUT NUTRITIONAL ASSESSMENTS AMONG VETERINARIANS

9. As part of your current job role, do you provide small animal nutrition-related education and/or advice to others (i.e. pet owners, veterinary staff, students) *Adakah anda memberikan pendidikan dan/atau nasihat tentang pemakanan haiwan kesayangan kepada orang lain (iaitu pemilik haiwan kesayangan, kakitangan veterinar, pelajar veterinar)*

- (●) Yes / *Ya*
- ( ) No / *Tidak*

10. Please state to whom you provide small animal nutrition-related education. *Sila nyatakan kepada siapa anda memberikan pendidikan berkaitan nutrisi haiwan.*

- [ ] Pet owners / *Pemilik haiwan peliharaan*
- [ ] Veterinary staff / *Staf veterinar*
- [ ] Veterinary students / *Pelajar veterinar*
- [ ] Pet food companies / *Syarikat makanan haiwan kesayangan*
- [ ] Pet store employees / *Kakitangan kedai haiwan kesayangan*

- [ ] Other Continuing Professional Development (CPD) or Continuing Education (CE) lectures /*Ceramah daripada pembangunan profesional berterusan atau pendidikan berterusan*
- [ ] Press / *Akhbar*
- [ ] University or College / *Universiti atau kolej*
- [ ] Other

14. Prior to this survey, were you aware that WSAVA's Global Nutrition Committee has developed a Global Nutrition Toolkit?
Sebelum tinjauan ini, adakah anda tahu bahawa Jawatankuasa Pemakanan Global WSAVA telah menghasilkan Kit Nutrisi Global?

These include practical aids for the veterinary healthcare team to make Nutritional assessment and recommendations more efficient. / Ini termasuk bantuan praktikal untuk pasukan kesihatan veterinar bagi membuat penilaian dan cadangan nutrisi yang lebih cekap.

- (●) Yes / *Ya*
- ( ) No / *Tidak*

15. Where did you hear about the WSAVA's Global Nutrition Toolkit? (please tick all that apply)
Di manakah anda tahu tentang Kit Nutrisi Global WSAVA? (sila tandakan semua yang berkenaan)

- [ ] WSAVA Congress / *Kongres WSAVA*
- [ ] WSAVA media or website / *Media atau lamab web WSAVA*
- [ ] Local Veterinary Association media or website / *Media atau lamab web persatuan veterinar tempatan*
- [ ] Other Continuing Professional Development (CPD) or Continuing Education (CE) lectures /*Ceramah daripada pembangunan profesional berterusan atau pendidikan berterusan*

- [ ] Press / *Akhbar*
- [ ] University or College / *Universiti atau kolej*
- [ ] Other

16. Which sections of WSAVA's Global Nutrition Toolkit are you familiar with? (please tick all that apply)
Bahagian manakah dalam Kit Nutrisi Global WSAVA yang anda kenali? (sila tandakan semua yang berkenaan)

- [ ] Body Condition Score charts / *Carta nilai keadaan badan*
- [ ] Muscle Condition Score charts / *Carta nilai keadaan otot*
- [ ] Calorie Recommendations / *Cadangan kalori*
- [ ] Diet History Form / *Borang sejarah pemakanan*
- [ ] Nutritional Assessment Checklist / *Senarai semak taksiran nutrisi*
- [ ] Hospitalized Patient Feeding Guide / *Panduan pemakanan pesakit haiwan*
- [ ] Tools for Pet Owners / *Bantuan untuk pemilik haiwan kesayangan*
- [ ] WSAVA Food Label Guides / *Panduan label makanan WSAVA*
- [ ] Infographic on Raw Meat Based Diets / *Infografik tentang makanan berasaskan daging mentah*

17. Please indicate the methods you use to stay informed and updated on the latest developments and research findings in the field of pet nutrition. Select all that apply.
Sila nyatakan kaedah yang anda gunakan untuk kekal maklum tentang perkembangan terkini dan penyelidikan terkini dalam bidang nutrisi haiwan peliharaan. Pilih semua yang berkaitan.

- [ ] Peer-reviewed Journals (e.g., JAVMA, JVIM) / *Jurnal semakan sebaya*

- [ ] Press / *Akhbar*
- [ ] University or College / *Universiti atau kolej*
- [ ] Other

16. Which sections of WSAVA's Global Nutrition Toolkit are you familiar with? (please tick all that apply)
Bahagian manakah dalam Kit Nutrisi Global WSAVA yang anda kenali? (sila tandakan semua yang berkenaan)

- [ ] Body Condition Score charts / *Carta nilai keadaan badan*
- [ ] Muscle Condition Score charts / *Carta nilai keadaan otot*
- [ ] Calorie Recommendations / *Cadangan kalori*
- [ ] Diet History Form / *Borang sejarah pemakanan*
- [ ] Nutritional Assessment Checklist / *Senarai semak taksiran nutrisi*
- [ ] Hospitalized Patient Feeding Guide / *Panduan pemakanan pesakit haiwan*
- [ ] Tools for Pet Owners / *Bantuan untuk pemilik haiwan kesayangan*
- [ ] WSAVA Food Label Guides / *Panduan label makanan WSAVA*
- [ ] Infographic on Raw Meat Based Diets / *Infografik tentang makanan berasaskan daging mentah*

17. Please indicate the methods you use to stay informed and updated on the latest developments and research findings in the field of pet nutrition. Select all that apply.
Sila nyatakan kaedah yang anda gunakan untuk kekal maklum tentang perkembangan terkini dan penyelidikan terkini dalam bidang nutrisi haiwan peliharaan. Pilih semua yang berkaitan.

- [ ] Peer-reviewed Journals (e.g., JAVMA, JVIM) / *Jurnal semakan sebaya*

SECTION C: ATTITUDE ABOUT NUTRITIONAL ASSESSMENTS AMONG VETERINARIANS

Please tell us about your interest in canine and feline nutrition.
Sila nyatakan kepada kami tentang minat anda terhadap nutrisi anjing dan kucing.

Definitions / Definisi:

- **Therapeutic food:** A therapeutic diet, also known as a "prescription diet", is formulated to meet the specific needs of the animal, usually designed to help mitigate, treat, or prevent diseases common to cats and dogs.
  ***Makanan terapeutik**: Diet terapeutik, yang juga dikenali sebagai "diet preskripsi", dirumus untuk memenuhi keperluan khusus haiwan. Ia biasanya direka untuk membantu mengurangkan, merawat atau mencegah penyakit yang biasanya dialami oleh kucing dan anjing.*

- **Non-therapeutic food:** Also known as a "functional diet", it encompasses the complete and balanced pet foods that are commonly sold at retail stores.
  ***Makanan bukan terapeutik:** Juga dikenali sebagai "diet berfungsi". Ia melambangkan makanan haiwan yang lengkap dan seimbang yang biasanya dijual di kedai-kedai runcit.*

18. How interested are you in nutrition related to therapeutic food and non-therapeutic food?
    Sejauh manakah anda berminat dengan nutrisi yang berkaitan dengan makanan terapeutik dan bukan terapeutik?

	1 - Not interested/ *Tidak berminat*	2 - A little interested / *sedikit berminat*	3 - Somewhat interested/ *Agak berminat*	4 - Very interested / *Sangat berminat*	5 - Extremely interested / *Paling berminat*
Therapeutic Food / *Makanan terapeutik*	○	○	○	○	○
Non-therapeutic Food / *Makanan bukan terapeutik*	○	○	○	○	○

19. On average, how much time do you spend researching or looking up **therapeutic food and non-therapeutic food** per month?
Secara purata, berapa banyak masa yang anda luangkan untuk mencari maklumat tentang makanan terapeutik dan bukan terapeutik setiap bulan?

	1- Never / *Tidak pernah*	2- Less than 1 hour / *kurang daripada 1 jam*	3- 1 to 5 hours / *1 hingga 5 jam*	4 - 6 to 10 hours / *6 hingga 10 jam*	5 - More than 10 hours / *lebih daripada 10 jam*
Therapeutic Food / *Makanan terapeutik*	○	○	○	○	○
Non-therapeutic Food / *Makanan bukan terapeutik*	○	○	○	○	○

20. When discussing nutrition with clients, how much confidence do you have in your own nutritional **knowledge of therapeutic food and of non-therapeutic food**?
Apabila membincangkan nutrisi dengan pelanggan, sejauh manakah keyakinan anda terhadap pengetahuan anda tentang makanan terapeutik dan bukan terapeutik?

	Not at all confident/ *Langsung tidak yakin*: 0-20%	Slightly confident / *sedikit yakin*: 21-40%	Moderately confident/ *Yakin*: 41-60%	Very confident/ *Agak yakin*: 61-80%	Extremely confident/ *Sangat yakin*: 81-100%
Therapeutic Food / *Makanan terapeutik*	○	○	○	○	○
Non-therapeutic Food / *Makanan bukan terapeutik*	○	○	○	○	○

Page 4 of 6

KAP OF NUTRITIONAL ASSESSMENTS AMONG SMALL ANIMAL VETS WITHIN KLANG VALLEY, MALAYSIA

SECTION D: LEVEL OF PRACTICE TOWARDS NUTRITIONAL ASSESSMENTS AMONG VETERINARIANS

21. Does your practice carry out any form of nutritional assessment as part of the routine assessment of patients' general health status?
Adakah klinik anda menjalankan sebarang bentuk penilaian nutrisi sebagai sebahagian daripada penilaian rutin status kesihatan am pesakit?

- ◯ No, never/ *Tidak pernah*
- ◯ At least 25% of overall consults/ *Sekurang-kurangnya 25% daripada masa konsultasi*
- ◯ At least 50% of overall consults / *Sekurang-kurangnya 50% daripada masa konsultasi*
- ◯ At least 75% of overall consults / *Sekurang-kurangnya 75% daripada masa konsultasi*
- ◯ Yes, always (100%) / *Ya, selalunya*
- ◯ Only for patients who are sick, overweight, or believed to be malnourished or at risk of malnourishment / *Hanya untuk pesakit yang sakit/tidak sihat, yang ada berat badan berlebihan, atau dipercayai kekurangan nutrisi atau berisiko kekurangan nutrisi*

22. Do you or your practice use any of the following nutritional assessment methods? (please tick all that apply)
Adakah anda atau klinik anda menggunakan mana-mana kaedah penilaian nutrisi yang berikut? (sila tandakan semua yang berkenaan)

- [ ] Bodyweight / *Berat badan*
- [ ] Body Condition Scoring (BCS) / *Keadaan nilai badan*
- [ ] Muscle Condition Scoring (MCS)/ *Keadaan nilai otot*
- [ ] Reviewing any changes in food intake or behavior/ *Menyemak sebarang perubahan dalam pengambilan atau tingkah laku pemakanan*
- [ ] Consideration of the condition of the skin and general health status/ *Timbangan atas keadaan kulit dan status kesihatan umum*
- [ ] Systematized nutritional assessment according to a Nutritional Assessment Form or Global Nutrition Toolkit/ *Penilaian nutrisi bersistematik mengikut Borang Penilaian Nutrisi atau Kit Nutrisi Global*
- [ ] Full clinical exam on all initial and repeat consultation, and at least daily on hospitalized animals/ *Peperiksaan klinikal yang lengkap pada semua konsultasi awal dan ulangan, dan sekurang-kurangnya setiap hari untuk haiwan yang dimasukkan ke dalam hospital*
- [ ] None of the above/ *Tiada satu pun di atas*

23. When admitting a patient, how often do you inquire about the following aspects of the pet's regular dietary routine? Please indicate the percentage of cases in which you typically ask about the criterions you relate to.
Apabila menerima pesakit, berapa kerapkah anda bertanya tentang aspek-aspek berikut dalam rutin pemakanan haiwan peliharaan? Sila nyatakan peratusan kes yang anda biasa tanya tentang kriteria yang anda kaitkan.

	No, never/ *Tidak pernah* (0%)	At least 25% of overall consults/ *se kurang-kurangnya 25% daripada keseluruhan konsultasi*	At least 50% of overall consults *sekurang-kurangnya 50% daripada keseluruhan konsultasi*	At least 75% of overall consults *sekurang-kurangnya 75% daripada keseluruhan konsultasi*	Always (100%) / *Selalu*	Only for patients who are sick, overweight, or believed to be malnourished or at risk of malnourishment / *Hanya untuk pesakit yang sakit, berat badan berlebihan, atau dipercayai kekurangan zat makanan atau berisiko kekurangan zat makanan*
Type of diet fed / *Jenis makanan yang diberi*	○	○	○	○	○	○
Bowl or dish used / *Mangkuk yang digunakan*	○	○	○	○	○	○
Timing of meals / *Waktu makan*	○	○	○	○	○	○
Flavor preferences/ *Pilihan rasa*	○	○	○	○	○	○

	No, never/ *Tidak pernah*	At least 25% of overall consults/ *sekurang-kurangnya 25% daripada keseluruhan konsultasi*	At least 50% of overall consults / *sekurang-kurangnya 50% daripada keseluruhan konsultasi*	At least 75% of overall consults / *sekurang-kurangnya 75% daripada keseluruhan konsultasi*	Always (100%) / *Selalu*
Sick pet visit / *Lawatan haiwan sakit*	○	○	○	○	○
Healthy pet visit / *Lawatan haiwan sihat*	○	○	○	○	○

25. In general, what keeps you from discussing nutrition during a **healthy pet appointment**?
(Please select up to 5 statements that you know are the greatest hinderance.)
Apakah halangan anda untuk membincangkan nutrisi semasa konsultasi haiwan peliharaan yang sihat? (Sila pilih sehingga 5 kenyataan yang anda tahu adalah halangan terbesar anda.)

Please select 5 options.

- ☐ Time constraints during consultations/ *Kekangan masa semasa konsultasi*
- ☐ The discussion is not raised or indicated/ *Perbincangan tidak dibangkitkan atau dinyatakan*
- ☐ I have little professional interest in healthy pet nutrition/ *Saya kurang minat profesional tentang nutrisi haiwan peliharaan yang sihat*
- ☐ I want to avoid a confrontation with a client/ *Saya mahu mengelakkan konfrontasi dengan pelanggan*
- ☐ Clients do not want to change their current brand of non-therapeutic food/ *Pelanggan tidak mahu menukar jenama makanan bukan terapeutik*

- [ ] There is too much misinformation online about non-therapeutic pet food / *Terdapat terlalu banyak maklumat yang salah di internet tentang makanan bukan terapeutik*
- [ ] There are too many new non-therapeutic products to keep up with/ *Terdapat terlalu banyak makanan bukan terapeutik baharu yang dalam saingan*
- [ ] I have limited knowledge around non-therapeutic food/ *Saya mempunyai pengetahuan yang terhad tentang makanan haiwan peliharaan yangbukan terapeutik*
- [ ] Non-therapeutic food is not sold at our practice/ *Makanan bukan terapeutik tidak di-jual di klinik kami*
- [ ] Clients are often concerned about the cost of changing to a new food/ *Pelanggan sering bimbang tentang kos apabila menukar kepada makanan baru*
- [ ] Clients are often concerned about their pets not accepting new food/ *Pelanggan sering bimbang bahawa haiwan peliharaan mereka tidak akan menerima makanan baru*
- [ ] Nothing dissuades me from discussing nutrition/ *Tidak ada halangan untuk saya membincangkan nutrisi*
- [ ] Other

Page 5 of 6

KAP OF NUTRITIONAL ASSESSMENTS AMONG SMALL ANIMAL VETS WITHIN KLANG VALLEY, MALAYSIA

THANK YOU FOR YOUR TIME

26. Thank you for considering this survey. If you're not interested in participating, we respect your decision. Are you still interested to learn about the WSAVA Nutritional Guidelines and the Global Nutritional Toolkit?

Terima kasih kerana mempertimbangkan tinjauan ini. Kami menghormati keputusan anda. Adakah anda masih berminat untuk mengetahui tentang Garis Panduan Nutrisi WSAVA dan Kit Nutrisi Global?

- ◯ Yes, I am interested./ *Ya, saya berminat*
- ◯ No, I am not interested./ *Saya tidak berminat*

You can print a copy of your answer after you submit

Page 6 of 6