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ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING CANINE DENTAL HEALTH AMONG DOG OWNERS IN MALAYSIA

By

SHIVAANI A/P SUNMUGAM

A RESEARCH PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF DOCTOR OF VETERINARY MEDICINE

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ABSTRACT

An abstract of the research paper presented to the Faculty of Veterinary Medicine, Universiti Malaysia Kelantan, in partial requirement of the course DVT 55204 – Research Project. Canine dental disease is one of the most common health conditions affecting dogs, yet preventive care is often overlooked by pet owners. This study assessed the Knowledge, Attitude, and Practice (KAP) regarding canine dental health among 100 dog owners in Malaysia using a cross-sectional survey. Findings showed that while knowledge and attitudes were generally positive—46% demonstrated good knowledge and 48% showed good attitudes—actual dental care practices remained insufficient, with only 26% achieving good practice levels. Significant associations were found between KAP levels and demographic factors such as age, gender, dog ownership experience, and dog age. Correlation analysis further revealed significant positive relationships between knowledge, attitude, and practice ($p < 0.05$), indicating that increased awareness contributes to improved behaviour. Despite this, a considerable gap persists between knowing the importance of dental care and consistently implementing it. The results highlight the need for targeted educational interventions, greater veterinary guidance, and improved accessibility of preventive dental services to enhance canine oral health in Malaysia.

Keywords : Canine dental health, Dog owners, Periodontal disease, Preventive veterinary care, Oral hygiene practices, Malaysia

ABSTRAK

Abstrak kertas penyelidikan yang dikemukakan kepada Fakulti Perubatan Veterinar, Universiti Malaysia Kelantan, sebagai memenuhi sebahagian daripada keperluan kursus DVT 55204 – Projek Penyelidikan. Penyakit pergigian anjing merupakan salah satu masalah kesihatan paling lazim dalam kalangan anjing peliharaan, namun penjagaan pencegahan sering diabaikan oleh pemilik haiwan. Kajian ini menilai Tahap Pengetahuan, Sikap dan Amalan (KAP) berkaitan kesihatan pergigian anjing dalam kalangan 100 orang pemilik anjing di Malaysia melalui tinjauan keratan rentas. Dapatan menunjukkan bahawa walaupun tahap pengetahuan dan sikap adalah positif—dengan 46% responden mencapai tahap pengetahuan yang baik dan 48% menunjukkan sikap yang baik—amalan penjagaan pergigian masih tidak memuaskan, di mana hanya 26% mencapai tahap amalan yang baik. Terdapat hubungan yang signifikan antara tahap KAP dengan faktor demografi seperti umur, jantina, pengalaman memiliki anjing dan umur anjing. Analisis korelasi turut menunjukkan hubungan positif yang signifikan antara pengetahuan, sikap dan amalan ($p < 0.05$), menandakan bahawa peningkatan kesedaran menyumbang kepada perubahan tingkah laku yang lebih baik. Walau bagaimanapun, jurang yang ketara masih wujud antara mengetahui kepentingan penjagaan pergigian dan melaksanakannya secara konsisten. Hasil kajian ini menekankan keperluan intervensi pendidikan yang lebih tersasar, bimbingan veterinar yang lebih menyeluruh serta peningkatan akses kepada perkhidmatan pencegahan pergigian bagi mempertingkatkan kesihatan oral anjing di Malaysia.

Kata kunci : Kesihatan pergigian anjing, Pemilik anjing, Penyakit periodontal, Penjagaan veterinar pencegahan, Amalan kebersihan mulut, Malaysia

CERTIFICATION

This is to certify that we have read this research paper entitled ‘ Assessment Of Knowledge, Attitude, And Practice Regarding Canine Dental Health Among Dog Owners In Malaysia’by Shivaani A/P Sunmugam, and in our opinion, it is satisfactory in terms of scope, quality, and presentation as partial fulfilment of the requirements for the course DVT55204 - Research Project.

Dr Mohammed Dauda Goni
DVM (UNIMAID), MSc in Public Health (UPM), PhD in Public Health and Epidemiology (USM)
Senior Lecturer
Faculty of Veterinary Medicine
Universiti Malaysia Kelantan
(Supervisor)

Dr. Norhidayah Binti Noordin
DVM (Universiti Malaysia Kelantan) MSc in Small Animal Medicine (Cardiology), UPM
Senior Lecturer
Faculty of Veterinary Medicine
Universiti Malaysia Kelantan
(Co - supervisor)

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DEDICATIONS

First and foremost, I would like to express my deepest gratitude to the Lord for granting me the health, strength, and perseverance needed to complete this research project successfully.

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LIST OF ABBREVIATIONS

KAP - Knowledge, Attitude, and Practice

WHO - World Health Organization

RVC - Royal Veterinary College

AAHA - American Animal Hospital Association

AVMA - American Veterinary Medical Association

VOHC - Veterinary Oral Health Council

LIST OF SYMBOLS

% = Percentage

n = The number of respondents

<= Less than

>= More than

r = Pearson Correlation Coefficient

p = Probability Value

* = Significant value

CHAPTER 1

INTRODUCTION

1.0 Research Background

Oral health is a vital component of overall well-being, not only for humans but also for companion animals such as dogs. In veterinary medicine, dental hygiene is overlooked, which progresses into periodontal disease as one of the most common conditions affecting adult dogs (Delamarter, 2024). According to Enlund *et al*. (2022), studies suggest that a majority of dogs over the age of three show some degree of dental disease. Despite its high prevalence, canine dental health remains a relatively under-addressed aspect of pet care, particularly in developing countries where public awareness and access to routine veterinary dentistry may be limited, with the addition of low-income pet owners disregarding dental health (Morris *et al*., 2021).

Periodontal disease represents the most prevalent oral health disorder in dogs, with epidemiological studies indicating that over 80% of the canine population is affected (Enlund *et al*., 2022). The condition progresses through two distinct clinical stages: gingivitis, a reversible inflammatory response confined to the gingival tissues, and periodontitis, an irreversible stage characterized by progressive destruction of the supporting structures of the teeth, although disease progression may still be managed with appropriate intervention, Dodd, (2011) suggest that the pathogenesis of periodontal disease begins with the accumulation of dental plaque, a biofilm composed of saliva, food particles, and a diverse population of microorganisms adherent to the tooth surface, where the plaque matures and the bacteria within the biofilm release toxins and metabolic by-products that incite an inflammatory response in the adjacent gingival tissues. In the absence of timely removal, plaque undergoes mineralization to form dental calculus (tartar), which extends subgingivally into the gingival sulcus where this progression

intensifies local inflammation, disrupts the periodontal ligament, promotes alveolar bone resorption, and compromises tooth stability which ultimately periodontal disease may culminate in tooth mobility and loss, with potential systemic implications due to chronic bacterial dissemination (Ford & Mazzaferro, 2007).

In Malaysia, the pet ownership landscape is evolving, with more households welcoming dogs as part of the family unit. However, anecdotal evidence and veterinary observations suggest that many dog owners may lack the necessary knowledge and practices related to maintaining their pet's oral hygiene. Factors such as limited awareness of the signs and consequences of dental disease, lack of routine dental check-ups, and misconceptions about appropriate preventive care are essential for maintaining good dental health in dogs and preventing serious issues (Niemiec, 2021).

Knowledge, Attitude, and Practice (KAP) studies provide a structured way to evaluate what people know (knowledge), how they feel (attitude), and how they act (practice) regarding a specific topic. Applying a KAP framework to canine dental health among dog owners in Malaysia can help identify gaps and barriers that need to be addressed through education, policy or veterinary outreach programs. Understanding these dimensions is critical for designing effective strategies to promote better oral health care for dogs, improve animal welfare, and potentially reduce the financial burden of advanced dental treatments.

2.0 Research Problem Statement

Canine dental health is often neglected until it reaches an advanced stage of periodontal disease. Most pets have poor oral hygiene and are presented with periodontal disease in advanced stages, which implies the lack of attention and knowledge of the owner. This neglect allows the disease to progress from gingivitis to periodontitis, and can lead to tooth loss. Although preventive measures and treatments are available, they are often not utilized effectively due to late diagnosis and lack of owner awareness. Therefore, it is important to determine the levels of the owners' knowledge, attitude and practice which the findings can be used to educate the owners.

3.0 Research Question

1) What is the level of knowledge among pet owners about dental care in dogs ?

2) What is the attitude of pet owners towards dental care in dogs?

3) What are the practices among pet owners regarding the prevention and management of periodontal disease in dogs?

4) What are the factors associated with the varying levels of KAP

4.0 Research Hypothesis

1) Pet owners have moderate knowledge about canine dental hygiene.

2) Pet owners have a generally positive attitude toward the importance of preventive oral care as a key factor in avoiding periodontal disease in dogs.

3) Pet owners practice inadequate preventive and management measures for periodontal disease.

4) The level of KAP varies with the various sociodemographic factors.

5.0 Research Objective

1) To assess the level of knowledge among pet owners in Malaysia regarding dental hygiene.
2) To evaluate the attitudes of dog owners in Malaysia regarding canine dental health.
3) To determine the practices of dog owners regarding prevention and management of periodontal disease in Malaysia.
4) To determine the factors associated with the levels of the knowledge, attitude and practice regarding periodontal disease and canine dental health in Malaysia.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Epidemiology Of Dental Health Conditions In Canines

Dental health disorders represent one of the most common and significant clinical problems in companion animals, particularly dogs (Barnes *et al.*, 2024). Periodontal disease, gingivitis, dental calculus accumulation, and tooth fractures account for the majority of dental presentations in veterinary practice where these conditions are widely recognized as highly prevalent, progressive, and largely preventable through appropriate owner education and routine oral care (Cunha *et al*., 2022).

Periodontal disease is consistently reported as the most widespread dental condition in dogs with epidemiological studies indicate that approximately 70–80% of dogs over three years of age exhibit some degree of periodontal pathology, ranging from mild gingivitis to advanced periodontitis (Enlund *et al*., 2022). The prevalence increases markedly with age, making dental disease one of the leading chronic conditions in adult and senior dogs (Stella *et al.,* 2018). According to Garanayak et al. (2019) young dogs may present with early gingivitis or retained deciduous teeth; however, significant plaque and calculus accumulation typically become prominent from one year of age onward.

Breed predispositions play an important role in the epidemiology of dental disorders (Kim *et al.,* 2025). Small and toy breeds, such as Chihuahuas, Poodles, Dachshunds, and Yorkshire Terriers, show a higher incidence of periodontal disease due to dental crowding, shallow periodontal pockets, and faster plaque accumulation (Wallis *et al.,* 2021). Brachycephalic breeds, including Pugs, Bulldogs, and Shih Tzu, are similarly predisposed because of malocclusions and altered anatomical spacing of the teeth (Bartels *et al*., 2015). Conversely, large breeds tend to be more susceptible to tooth fractures, often resulting from chewing behaviors or environmental trauma (Bilyard *et al*., 2023).

Several risk factors contribute to the development and severity of dental disease in dogs. These include intrinsic factors such as age, genetics, breed conformation, and retained deciduous teeth. Extrinsic factors particularly those related to owner practices

play an equally important role; inadequate toothbrushing, lack of routine veterinary dental checks, and feeding soft or mixed diets greatly increase the likelihood of dental pathology (Boy *et al.*, 2016).

Environmental factors, such as limited access to dental chews or poor oral hygiene resources, further exacerbate disease progression (Fu *et al.*, 2025). The clinical and public health significance of canine dental disease extends beyond oral discomfort. Left untreated, chronic inflammation and bacterial proliferation can lead to tooth mobility, tooth loss, halitosis, and pain (Enlund *et al.,* 2020). Systemic implications, including secondary effects on the heart, kidneys, and liver, have also been documented due to the dissemination of oral bacteria and inflammatory mediators (Li *et al*., 2000). As most dental diseases are preventable with proper awareness and hygiene practices, epidemiological trends underscore the need for improved knowledge, attitudes, and practices (KAP) among dog owners to reduce the burden of dental pathology and enhance overall canine welfare (Yu *et al.,* 2024).

2.2 Owner's Perspective About Dental Health

Dog owners often face significant challenges in properly inspecting and caring for their dogs' dental health, mainly due to uncooperative behavior from their pets and practical difficulties as this hinders regular dental practices like tooth brushing, leading to neglect despite the high prevalence of dental disease in dogs (Niemiec, 2021). Many owners underestimate the severity of dental issues such as dental calculus and gingivitis, with low brushing frequency remaining a common problem and some owners also attempt risky practices like using dental scalers themselves, which veterinary professionals advise against (Schell, 2013). These findings underscore the need for better education on dental care, early training to establish oral hygiene routines, and more consistent professional dental assessments to improve canine oral health outcomes. (Enlund *et al.*, 2020)

Research also indicates that owners of smaller, older, and predisposed breeds tend to recognize poorer dental health in their dogs, implying awareness influenced by risk factors (Wallis *et al.,* 2021). Moreover, owners of dogs with chronic illnesses may have heightened perception of dental problems, reflecting a degree of concern aligned with

overall health awareness (Enlund *et al*., 2020). Yet, the general pattern reveals many owners either cannot or do not regularly evaluate their dogs' mouths thoroughly, reinforcing the necessity for enhanced owner training and veterinary guidance on home dental care (Enlund *et al.*, 2022).

Encouragingly, some studies show owners of dogs with diagnosed periodontal disease tend to be more committed to dental home care, including tooth brushing ; however, daily brushing remains insufficiently practiced across the wider dog-owning population, highlighting an area for improvement to halt disease progression (Svärd, 2023). Understanding dog owners' difficulties and motivational factors can help develop strategies to increase adherence to recommended dental care practices, ultimately improving the oral and overall health of dogs (Svärd 2023 & Enlund, 2020; Rooney *et al.,* 2021).

2.3 Current Dental Issues

Dental disease is one of the most common yet frequently overlooked health problems in dogs, often going unrecognised by owners as a significant welfare concern. Research conducted by the Royal Veterinary College (RVC) reveals that 1 in 8 dogs (12.5%) suffers from dental disease annually, with the condition causing severe and prolonged pain that may last for weeks or even months. In addition to local oral discomfort, poor dental health can lead to serious systemic issues such as kidney and heart disease (Niemiec, 2021). Many dogs continue to eat despite dental pain, making it difficult for owners to detect the problem.

In an analysis of more than 22,000 anonymised veterinary records, the study demonstrated that the risk of periodontal disease was significantly higher in smaller and older dogs. Small breed dogs weighing less than 10 kg were found to have a 3.07 X increased risk compared with larger dogs when compared to, while dogs aged 12 years and above had a 3.91 X greater risk than those aged 2 to 4 years. Breed-related susceptibility was also evident, with Toy Poodles, King Charles Spaniels, Greyhounds, and Cavalier King Charles Spaniels showing particularly high risk as brachycephalic breeds are also predisposed to have higher risk of periodontal disease. Conversely, larger breed dogs such as German Shepherds, French Bulldogs, Staffordshire Bull Terriers, and Labrador

Retrievers exhibited a comparatively lower risk (O'Neill *et al.*, 2021). To address this widespread issue, the RVC emphasizes the importance of early prevention through daily tooth brushing using dog-specific toothpaste, particularly in high-risk breeds. Improved awareness and targeted veterinary interventions can significantly enhance the quality of life and overall health of affected dogs (Greenfield, 2024).

2.4 Barriers In Treating Dental Problems In Dogs

It is important to recognize the barriers to treating dental problems in dogs, as many pet owners tend to neglect their pets' oral health for various reasons, which can have serious consequences for the animals' overall well-being (Enlund *et al.*, 2022). One of the main causes is a general lack of awareness where many people simply do not realize how important dental hygiene is for pets. Unlike humans, animals rarely show obvious signs of dental pain, which leads owners to assume that everything is fine (Niemiec, 2021). This lack of awareness is further compounded by the fact that some owners underestimate how dental diseases such as periodontal disease, can affect major organs including the heart, liver, kidneys and contribute to long-term health complications (Alsalleeh *et al.,* 2022). Another common barrier is fear of anesthesia, particularly for older pets or those with pre-existing health problems, which makes owners hesitant to pursue professional dental cleanings or procedures (Vall, 2025). In a study Bahadori et al., (2013) the perceived high cost of dental care is a significant deterrent as routine check-ups, treatments and cleanings may appear financially burdensome, especially for owners without pet dental insurance.

Additionally, many pet owners struggle to make dental care a regular part of their routine due to time constraints or simply forgetting, especially when faced with pet resistance (Enlund *et al.*, 2022). Some pets dislike having their teeth brushed or their mouths handled, making the process frustrating and discouraging for their owners (Gawor *et al.*, 2024). This often leads to a reliance on dental chews or dry kibble, under the false belief that these products are sufficient to maintain good oral hygiene when in fact they only offer partial benefits (Enlund *et al.*, 2020). Furthermore the subtle nature of dental disease progression in pets where they can still eat, play, and behave normally even when suffering from painful oral conditions causing signs like bad breath or drooling to be

overlooked until the disease is advanced (Barnes *et al.*, 2024). There is also a widespread misconception that dental problems are a natural and unavoidable part of aging, which causes some owners to believe that treatment is unnecessary or ineffective for older pets (Greenfield, 2024). Lastly, the lack of proactive guidance from veterinarians can contribute to this issue. When dental care is not emphasized or when owners are not properly educated on how to care for their pet's teeth at home, they are less likely to take action (Goldstein, 2001).

Understanding these reasons is crucial in encouraging more proactive pet dental care. With better education, accessible resources, and support from veterinary professionals, owners can overcome these challenges and ensure their pets maintain healthy teeth and gums, ultimately leading to longer, happier lives. (Greenfield, 2024)

2.5 Importance Of Oral Health And Hygiene In Pets

The importance of oral health and hygiene in pets is to be able to maintain their overall well-being and quality of life. Just like humans, pets are susceptible to various dental issues such as plaque buildup, tartar, gingivitis, and periodontal disease. These problems if left untreated can lead to pain, tooth loss, and serious systemic conditions affecting the heart, liver, and kidneys (Niemiec, 2021).

Maintaining good oral hygiene helps prevent these complications and ensures pets can eat comfortably, play actively, and live without the discomfort of untreated dental disease. Regular dental care including tooth brushing, veterinary checkups, and professional cleanings not only extends a pet's lifespan but also improves their daily comfort and happiness (Goldstein, 2001). Early detection and prevention are key, as many pets hide signs of pain, making it easy for oral issues to go unnoticed until they become severe. Therefore, educating pet owners about the importance of oral health and encouraging routine dental care is essential for promoting the long-term health of their furry companions.

CHAPTER 3

3.0 METHODOLOGY

3.1 Study Area

This study was conducted across the entire Malaysia including Sabah & Sarawak.

3.2 Study Design

A cross-sectional survey design was employed to collect data from dog owners in Malaysia. This approach enabled the assessment of respondents' levels of knowledge, attitudes, and practices regarding canine dental hygiene and oral health at a single point in time. The design was considered appropriate for identifying prevailing perceptions and behaviors related to preventive dental care among the target population.

3.3 Study Population

This study was conducted among dog owners in Malaysia. The target population included individuals responsible for the daily care and health management of their dogs, regardless of breed, age, or sex. Data obtained from this population provided insights into current practices and perceptions related to canine dental health within the Malaysian context.

3.4 Selection Criteria

3.4.1 Inclusion Criteria

The study included Malaysian dog owners aged 18 years and above who currently own dogs or had owned at least one dog within the past five years. Participants were required to have had experience owning a dog within the last two years to ensure recent exposure to canine health care practices. This criterion ensured that respondents could provide relevant and reliable information regarding canine dental health management.

3.4.2 Exclusion Criteria

Individuals who do not own dogs were excluded from the study.

Non-Malaysian residents were also excluded. In addition, individuals below 18 years of age were not eligible to participate.

3.5 Sampling Method And Procedure

This study utilised a non-probability convenience sampling approach, in which data were collected through an online survey designed using Google Forms. The questionnaire link was widely disseminated via popular Malaysian social media platforms, including Instagram, WhatsApp, Facebook, and Telegram, to maximise outreach to potential participants.

To determine the minimum sample size required, the single-proportion formula was applied. Using the Calculator.net sample size calculator, the population proportion (P) was set at 50%, while the margin of error was adjusted to 10%. This modification was made following expert guidance from the appointed supervisor, with the intention of reducing the population proportion to achieve a practical and statistically acceptable minimum sample size. Based on these parameters, the calculated sample size was 97. Nevertheless, during data collection, a total of 100 responses were successfully obtained, exceeding the minimum requirement.

3.6 Data Collection Tools

Data for this study are collected using a validated online questionnaire developed with Google Forms, following a quantitative Knowledge, Attitude, and Practice (KAP) survey design. It consists of four sections: sociodemographic information, knowledge, attitude, and practice, containing a combination of closed-ended questions and Likert scale items that enable quantitative scoring and analysis.

In the knowledge section, each correct response receives a score of 1, while incorrect or "not sure" answers receive 0. The total knowledge score reflects the number of correct responses, and scoring is classified according to the Bloom's cut-off categories Goni et al. (2019) was used in this study: 0–2 indicates Poor knowledge, 3–4 indicates Moderate knowledge, and 5–7 indicates Good knowledge.

For the attitude section, responses are recorded on a four-point Likert scale ranging from "strongly disagree" to "strongly agree," and scoring is converted into cumulative attitude values. These totals are then categorised according to the study's Bloom's criteria: 0–10 is interpreted as Poor attitude, 11–19 as Moderate attitude, and 20–28 as Good attitude.

Similarly, the practice section evaluates routine dental care behaviours using response options such as never (1) to always (6),which are scored respectively. The cumulative practice score is subsequently classified based on Bloom's cut-off values: 0–14 represents Poor practice, 15–28 reflects Moderate practice, and 29–42 denotes Good practice.

Together, these scoring systems enable categorisation of dog owners' knowledge, attitudes, and practices toward canine dental health, providing a structured and standardised method for evaluating KAP levels within the Malaysian population.

3.7 Validity And Reliability

A pilot study was conducted and the questionnaire was translated into Malay and English and underwent content validation by two veterinary lecturers. Before the main study, a pilot test was conducted with 20 respondents who met similar criteria to assess face validity. Face validity was assessed through expert review by veterinarians and academic supervisors, who evaluated whether the questionnaire items were clear, relevant, and appropriate for measuring knowledge, attitudes, and practices on canine dental health. Feedback from both experts and pilot participants was used to refine and improve the questionnaire.

Reliability test was then performed using Cronbach's alpha on the knowledge, attitude, and practice (KAP) sections, yielding a value of 0.803. The value being more than 0.7, indicated an acceptable internal consistency reliability. (Arof et al., 2018).

3.8 Data Analysis

The data was analyzed using IBM Statistical Package Social Science (SPSS) Version 29, with Pearson Chi-square used to assess the association between socio-demographic variables and the level of knowledge, attitudes, and practices (KAP) toward dental hygiene practices in dogs. The categorical data from socio-demographic variables were analysed descriptively and presented as a frequency (percentage %), while numerical data was presented as an inferential statistics.

3.9 Ethical Approval

As humans were involved in this investigation, human ethics approval was required. An ethics application was submitted, and approval was obtained under the code UMK/FPV/HUMAN/EXT/0008/2025.

A clear Participant Information Sheet was provided at the beginning of the Google Form, outlining the study purpose, procedures, confidentiality, and data handling to ensure respondents gave informed consent before proceeding. Participation was entirely voluntary, with no incentives or pressure applied, and respondents were free to skip any questions they found uncomfortable.

The right to withdraw was also communicated. Participants could exit the form at any time before submission, although withdrawal after submission was not possible due to the anonymous nature of the data. These measures ensured that the study upheld ethical principles of autonomy, transparency, and respect for participants.

CHAPTER 4

4.0 RESULTS

4.1 Socio-demographic Characteristics of Respondents

A total of 100 participants were recruited. The study results highlighted the dominant sociodemographic characteristics among the respondents as shown in Table 4.1. The majority of the respondents were female, constituting 65% (65/100), and the most common age group was 18–25 years, representing 39% (39/100).

In terms of race, most respondents were identified as Indians, accounting for 64% (64/100). Regarding employment status, the private sector employed the largest group, comprising 35% (35/100). For dog-ownership characteristics, most respondents reported having no salary, accounting for 30% (30/100).

Table 4.1 : Summary of Respondent (*n* = 100)

Socio- Demographic Characteristics		Total (n= 100)	
		freq	%
Gender	Male	35	35
	Female	65	65
Age (Years)	18 - 25	39	39
	26 - 39	37	37
	40 - 59	18	18
	60 - 70	4	4
	> 71	2	2
Race	Malay	3	3
	Chinese	26	26
	Indian	65	65
	Others	6	6

Employment status	Civil servant	13	13
	Self employed	8	8
	Private sector	36	36
	Pensioner	6	6
	Housewife	2	2
	Student	33	33
	Unemployed	2	2
Salary	< RM 2500	10	10
	RM 2500 - RM 4850	28	28
	RM 4850- RM 10,000	27	27
	> RM 10,001	5	5
	None	30	30

4.2 Respondent Owned Pet's Information

Based on table 4.2, the largest proportion had been dog owners for more than six years, representing 48% (48/100). In terms of number of dogs owned, the majority owned one dog, making up 51% (51/100). Most dogs were adults aged 1–7 years, comprising 50% (50/100). Medium-breed dogs were the most common, accounting for 34% (34/100). With regard to dietary practices, the majority of respondents fed their dogs a mixed diet, representing 34% (34/100). Additionally, most participants reported having received veterinary advice on general pet care, accounting for 76% (76/100).

Table 4.2 : Summary of Respondent Owned Pet's Information (n=100)

Respondent Owned Pet's Information		Total (n= 100)	
		freq	%
How many years have you been a dog owner?	Less than 1 year	15	15
	1–3 years	22	22
	4–6 years	15	15
	More than 6 years	48	48
How many dogs do you have/had own?	1	51	51
	2-3	35	35
	4-5	7	7
	More than 5	7	7
What is the age of your dog(s)?	Puppy (<1 Year)	16	16
	Adult (1-7 years)	50	50
	Senior (>7years)	34	34
What breed type is your dog(s)?	Small breed	30	30
	Medium Breed	34	34
	Large Breed	16	16
	Mixed Breed	20	20
What is the primary diet of your dog(s)?	Commercial dry food (kibble)	32	32
	Wet canned food	7	7
	Raw diet	0	0
	Home - cooked food	27	27
	Mixed	34	34
Have you ever received advice from a veterinarian regarding general pet care?	Yes	76	76
	No	24	24

4.3 Assessment of Knowledge

Regarding knowledge on optimal dental care practices, most respondents believed that a dog's teeth should be brushed once a week, accounting for 41% (41/100). When asked about the most common dental disease in adult dogs, the majority correctly identified periodontal disease, representing 62% (62/100).

In terms of the age at which dogs typically begin to show signs of dental disease without preventive care, responses were evenly distributed, with the highest proportions selecting either around 3 years or 5 years or older, each making up 42% (42/100). Furthermore, when identifying clinical signs of dental disease, most respondents selected "all of the above", demonstrating broader recognition of signs such as bad breath, difficulty eating, and drooling, with 60% (60/100)choosing this option.

With respect to diet-related risks, the majority indicated that soft or wet canned food contributes most to plaque build-up, accounting for 71% (71.7/100). Other than that, when assessing awareness of systemic effects, over half of the respondents acknowledged that untreated dental disease can affect vital organs such as the heart, kidneys, and liver, with 54% (54/100) answering "yes.". Lastly, for a general knowledge of the definition of calculus we can see 80% (80/100) choose hardened plaque that can cause gum disease as the correct answer.

Table 4.3 Summary of knowledge of dog owners regarding canine dental health

Respondent's knowledge		Total (n= 100)	
		freq	%
How often should a dog's teeth be brushed for optimal dental health?	Daily	20	20
	Once a week	41	41
	Once a month	15	15
	Only when visibly dirty	24	24
What is the most common dental disease in adult dogs?	Periodontal disease	62	62
	Oral cancer	11	11
	Broken teeth	16	16
	Gingival hyperplasia	11	11

At what age do most dogs start to develop signs of dental disease if no preventive care is given?	Under 1 year	11	11
	Around 3 years	42	42
	5 years or older	42	42
	Never	5	5
Which of the following is a sign of dental disease in dogs?	Bad breath	18	18
	Difficulty eating	14	14
	Drooling or pawing at the mouth	8	8
	All of the above	60	60
Which food type is more likely to contribute to plaque build-up?	Soft/wet canned food	71	71.7
	Dry kibble	7	7.1
	Raw bones	10	10.1
	None	11	11.1
Can untreated dental disease in dogs affect other organs (heart, kidney, liver)?	Yes	54	54
	No	44	44
	Not sure	2	2
What is dental calculus ?	A harmless stain on the teeth	7	7
	A natural protective coating on teeth	5	5
	A tooth infection	8	8
	Hardened plaque that can cause gum disease	80	80

4.4 Assessment of Attitude

Overall, respondents demonstrated a generally positive attitude toward canine dental health. A majority perceived dental care as very important for their dog's overall well-being, accounting for 68% (68/100) of the participants. Consistent with this perception, 70% (70/100) indicated that they would be willing to brush their dog's teeth regularly if it contributed to improved health outcomes.

In terms of professional dental services, the largest proportion of respondents (55%, 55/100) believed that regular veterinary dental cleaning is necessary, while 39% felt that such procedures were only required when problems arise. Financial considerations also played a notable role, with 50% (50/100) reporting that they were very concerned about the cost of dental care, and a further 45% expressing moderate concern.

Attitudes toward common clinical signs were also assessed. More than half of the respondents (52%, 52/100) did not believe that bad breath is normal in dogs, reflecting an awareness that it may indicate underlying dental issues. When asked to prioritise dental care relative to other preventive measures, the highest proportion (42%, 42/100) reported that they would not prioritise dental care, although 40% (40/100) stated that their decision would depend on cost, indicating that financial factors may influence preventive care choices.

Finally, most respondents (67%, 67/100) believed that their dogs enjoy chewing toys or dental treats, suggesting openness to incorporating such tools into their pet's oral hygiene routine.

Table 4.4 Summary of attitude of dog owners regarding canine dental health

Respondent's attitude		Total (n= 100)	
		freq	%
How important do you think dental care is for your dog's overall health?	Very important	68	68
	Somewhat important	26	26
	Not important	6	6

Would you be willing to brush your dog's teeth regularly if it improved their health?	Definitely yes	70	70
	Maybe	27	27
	No	3	3
Do you believe professional dental cleaning by a veterinarian is necessary?	Yes, regularly	55	55
	Only if these is a problem	39	39
	Not necessary	6	6
How concerned are you about the cost of dental care for your dog?	Very concerned	50	50
	Somewhat concerned	45	45
	Not concerned	5	5
Do you think bad breath in dogs is normal and not a cause for concern?	Yes	21	21
	No	52	52
	Not sure	27	27
Would you prioritise dental care over other preventive measures ?	Yes	18	18
	No	42	42
	Depends on cost	40	40
Do you believe your dog enjoys chewing toys or treats that help clean their teeth?	Yes	67	67
	No	13	13
	Not sure	20	20

4.5 Assessment of Practice

In terms of dental care practices, the findings indicate that actual implementation of preventive measures remains limited despite generally positive attitudes. With regard to tooth-brushing frequency, the largest proportion of respondents (40%, 40/100) reported never brushing their dog's teeth, while only 8% performed daily brushing. Toothpaste use further reflected this trend, as 53% (53/100) stated that they do not use any toothpaste, whereas only 42% used toothpaste formulated specifically for dogs.

When considering the use of dental chews or toys, which serve as supplementary cleaning tools, the majority (47%, 47/100) reported giving them occasionally, while 27% used them regularly. Professional dental cleaning practices also showed low engagement, with 46% (46/100) indicating they never bring their dog for veterinary dental cleaning, and only 16% doing so annually.

Monitoring for signs of dental problems was moderately practiced, with 43% (43/100) performing checks occasionally, and 37% doing so regularly. Dietary practices aimed at reducing plaque accumulation showed a similarly varied pattern: 35% (35/100) reported feeding dental-supportive diets, whereas the remaining respondents were either unsure (33%) or did not use such diets (32%).

Lastly, when assessing adherence to professional guidance, the responses were distributed, with 36% (36/100) having never received veterinary advice regarding dental care. Among those who had, 34% (34/100) reported following the advice provided, while 30% did not follow it consistently.

Table 4.5 Summary of practice of dog owners regarding canine dental health

Respondent's practice		Total (n= 100)	
		Freq	**%**
How often do you brush your dog's teeth?	Daily	8	8
	Weekly	34	34
	Monthly	18	18
	Never	40	40

Do you use toothpaste made specifically for dogs?	Yes	42	42
	No, I use human toothpaste	5	5
	No, I don't use toothpaste	53	53
Do you give your dog dental chews or toys to help clean their teeth?	Regularly	27	27
	Occasionally	47	47
	Never	26	26
How often do you bring your dog for professional dental cleaning by a veterinarian?	Once a year	16	16
	Every 2-3 years	13	13
	Only when a problem occurs	25	25
	Never	46	46
Do you check your dog's mouth for signs of dental problems (red gums, loose teeth, bad breath)?	Regularly	37	37
	Occasionally	43	43
	Never	20	20
Do you feed your dog a diet that helps reduce plaque (e.g., dental kibble)?	Yes	35	35
	No	32	32
	Not sure	33	33
Have you ever received advice from a veterinarian about your dog's dental care?	Yes, and I follow it	34	34
	Yes, but I don't follow it consistently	30	30
	No	36	36

4.6 Respondent's Level of Knowledge, Attitude And Practice with Bloom's Cut-Off Criteria

As shown in Table 4.6, the distribution of Knowledge, Attitude, and Practice levels was evaluated using Bloom's Cut-Off criteria. For the Knowledge domain, the *Good* category (scores 5 to 7) had the highest representation, with n = 46 (46%)respondents. This indicates that almost half of the participants demonstrated strong understanding of canine dental health. Meanwhile, 28% fell into the *Poor* category, suggesting that a notable portion of respondents still lack essential knowledge in this area.

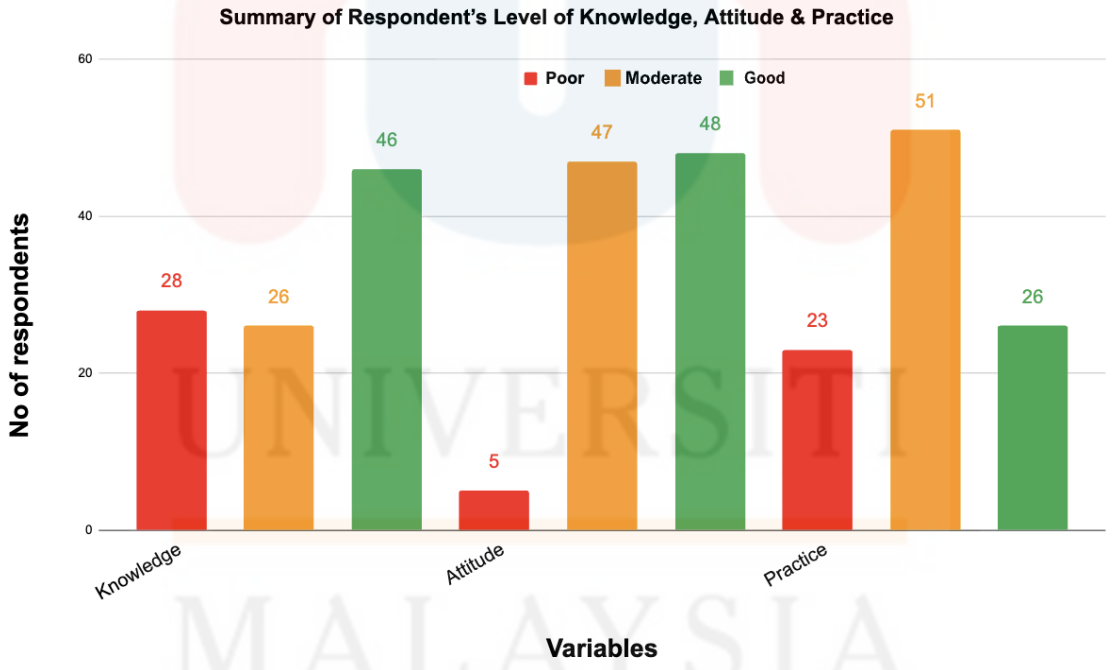
In terms of Attitude, the *Good* level (scores 20 to 28) also ranked the highest, comprising n = 48 (48%) respondents. Additionally, a substantial proportion (47%) scored within the *Moderate* range, reflecting generally positive perceptions toward canine dental care. Only a small proportion (4%) exhibited poor attitudes, indicating minimal resistance or negative beliefs among the population.

However, the pattern differed in the Practice domain. The majority of respondents fell into the *Moderate* level (scores 15 to 28), with n = 51 (51%) participants, while 26% achieved *Good* practice scores. Importantly, 23% were classified under *Poor* practice, indicating that despite relatively strong knowledge and favourable attitudes, many respondents still struggle to implement consistent and effective dental care practices for their dogs.

Overall, these findings suggest that while respondents generally possess adequate knowledge and positive attitudes, there remains a gap between awareness and actual behaviour, emphasising the need for targeted interventions to improve practical engagement in canine dental health care.

Table 4.6 Summary of Respondent's Level of Knowledge, Attitude And Practice with Bloom's Cut-Off Criteria

Variables	Level	Score	n (%)
Knowledge	Poor	0 - 2	28 (28.0%)
	Moderate	3 - 4	26 (26.0%)
	Good	5 - 7	46 (46.0%)
Attitude	Poor	0 - 10	4 (4.0%)
	Moderate	11 - 19	47 (47.0%)
	Good	20 - 28	48 (48.0%)
Practice	Poor	0 - 14	23 (23.0%)
	Moderate	15 - 28	51 (51.0%)
	Good	29 - 42	26 (26.0%)



4.7 Association Between Socio-demographic Variables And KAP

4.7.1 Associations Between Socio-demographic Variables and the Knowledge level

Based on Table 4.7.1, the analysis examining the association between sociodemographic characteristics and respondents' knowledge levels revealed several notable findings. Age was significantly associated with knowledge ($p = 0.038$). Among the age groups, respondents aged 18–25 years constituted the largest proportion ($n = 39$) and demonstrated the highest frequency of good knowledge (24 respondents). This trend suggests that younger adults tend to possess stronger knowledge regarding canine dental care compared to older individuals.

Gender also showed a statistically significant relationship with knowledge level ($p = 0.008$). Female respondents, who represented the majority of the sample (65%), exhibited a higher proportion of good knowledge ($n = 36$). In contrast, male respondents displayed a more even distribution across poor, moderate, and good knowledge categories. These findings indicate that female dog owners generally demonstrated better knowledge levels than their male counterparts.

Although race did not show a significant association with knowledge level ($p = 0.664$), descriptive patterns highlighted that Indian respondents, who formed the largest racial subgroup (65%), contributed the highest number of individuals with good knowledge ($n = 29$), followed by Chinese respondents ($n = 12$). Despite these differences, the variation across races did not reach statistical significance.

Employment status similarly did not demonstrate a significant association with knowledge ($p = 0.107$). Nevertheless, respondents working in the private sector comprising the largest employment subgroup ($n = 44$) accounted for a considerable number of individuals with good knowledge ($n = 18$). Students also showed a high representation in the good knowledge category ($n = 22$), although the association remained statistically non-significant.

Conversely, the salary category showed a significant association with knowledge levels ($p = 0.023$). Respondents who reported having no salary which included groups

such as students, retirees, and homemakers and accounted for 30% of the sample recorded the highest number of individuals with good knowledge (n = 21). This pattern suggests that those without active income, particularly students who may have greater educational exposure, tended to demonstrate stronger knowledge in canine dental care.

Years of dog ownership also showed a significant association with knowledge levels (p = 0.044). Respondents who had owned dogs for more than six years formed the largest subgroup (n = 48) and demonstrated the greatest frequency of good knowledge (n = 29), indicating that prolonged experience in dog ownership contributes positively to knowledge acquisition.

In contrast, the number of dogs owned did not show a significant association with knowledge (p = 0.149). Although individuals owning a single dog represented the majority (n = 51), their knowledge levels were relatively balanced across categories, despite a slight tendency toward good knowledge.

In addition, dog age category was significantly associated with knowledge (p = 0.049). Owners of adult dogs (1–7 years), the largest subgroup (n = 50), exhibited the greatest proportion of good knowledge (n = 20). Owners of senior dogs also contributed notably to the good knowledge category (n = 21), suggesting that caring for older dogs may require or encourage greater knowledge.

Furthermore, breed type did not show a significant relationship with knowledge (p = 0.535). Despite this, owners of medium-breed dogs, the largest breed subgroup, recorded the highest number of good knowledge responses (n = 23), though the association remained non-significant statistically.

Similarly, primary diet type was not significantly associated with knowledge (p = 0.266). Respondents who fed commercial dry food, the most common dietary practice (n = 32), had the highest number of individuals with good knowledge (n = 20), although this association did not reach statistical significance.

Table 4.7.1 Summary of The Associations Between Socio-demographic Variables and the Knowledge level

Variable		Knowledge Level			Total	Chi Square	P value
		Poor	Moderate	Good			
Age	18–25	7	8	24	39	16.328	0.038*
	26–39	9	10	18	37		
	40–59	10	6	2	18		
	60–70	1	2	1	4		
	> 71	1	0	1	2		
Gender	Male	16	9	10	35	9.592	0.008*
	Female	12	17	36	65		
Race	Indian	17	19	29	65	4.094	0.664
	Chinese	7	7	12	26		
	Malay	1	0	2	3		
	Others	3	0	3	6		
Employment	Civil servant	6	4	3	13	15.753	0.107
	Housewife	1	1	0	2		
	Pensioner	3	2	1	6		
	Private sector	13	13	18	44		
	Student	5	6	22	33		
	Unemployed	0	0	2	2		
Salary	<RM2500	2	4	4	10	17.799	0.023*
	>RM10001	2	3	0	5		
	None	5	4	21	30		
	RM2500–RM 4850	12	5	11	28		
	RM4850–RM 10000	7	10	10	27		

Ownership years	1–3 years	6	7	9	22	12.965	0.044*
	4–6 years	6	4	5	15		
	<1 year	4	8	3	15		
	>6 years	12	7	29	48		
Number of dogs owned	1	12	13	26	51	9.464	0.149
	2–3	9	12	14	35		
	4–5	2	1	4	7		
	>5	5	0	2	7		
Dog age	Adult	14	16	20	50	9.55	0.049*
	Puppy	4	7	5	16		
	Senior	10	3	21	34		
Breed type	Large	6	3	7	16	3.138	0.535
	Medium	17	14	23	54		
	Small	5	9	16	30		
Diet	Commercial dry	5	7	20	32	7.642	0.266
	Home-cooked	11	7	9	27		
	Mixed	10	9	15	34		
	Wet canned	2	3	2	7		

***statistically significant**

4.7.2 The Associations Between Socio-demographic Variables and the Attitude level

Based on Table 4.7.2, the analysis of the associations between sociodemographic characteristics and respondents' attitude levels revealed several noteworthy findings. Overall, only a few variables demonstrated statistically significant associations with attitude scores, whereas others showed descriptive trends that did not reach statistical significance.

To begin with, age did not show a statistically significant relationship with attitude levels ($p = 0.451$). Nevertheless, the majority of respondents fell within the 18–25 age group, where most individuals demonstrated a good attitude (23 out of 39). Similarly, respondents aged 26–39 showed an equal distribution of moderate and good attitude responses (17 each). Although these descriptive patterns suggest that younger adults tend to exhibit more favourable attitudes, the differences across age groups were not statistically meaningful.

In contrast, gender showed a significant association with attitude levels ($p = 0.003$). Female respondents, who constituted the majority of the sample (65%), demonstrated a higher proportion of good attitudes (36) compared to males. Conversely, male respondents showed a more varied distribution across poor (5), moderate (18), and good (12) categories. This finding therefore indicates that female dog owners are more likely to hold positive attitudes toward canine dental care.

With regard to race, no significant association with attitude level was detected ($p = 0.543$). Even so, the Indian subgroup which represented the largest racial category (65%) recorded the highest number of good attitude responses (36). Chinese respondents, on the other hand, exhibited predominantly moderate attitudes (15). Despite these descriptive differences, the overall association remained statistically insignificant.

Similarly, employment status did not show a significant association with attitude level ($p = 0.166$). However, individuals employed in the private sector (44 respondents) accounted for the highest number of moderate (22) and good (17) attitude responses. Students also demonstrated favourable attitudes, with 21 respondents presenting good attitude scores. These patterns suggest some variability across occupations, though not to a degree sufficient to achieve statistical significance.

The salary category also did not show a significant association with attitude ($p = 0.491$). Respondents without a salary, representing the largest salary subgroup (30 respondents), recorded notable moderate (13) and good (17) attitude scores. Even though these observations indicate that those without a salary tended to report more positive attitudes, income level overall did not appear to influence respondents' attitudes toward canine dental care.

By contrast, the number of years of dog ownership demonstrated a statistically significant association with attitude levels ($p = 0.046$). Respondents who had owned dogs for more than six years recorded the highest frequency of moderate (23) and good (24) attitudes. This implies that greater experience in dog ownership positively contributes to the formation of favourable attitudes, potentially due to increased familiarity with pet care practices.

Regarding the number of dogs owned, no significant association with attitude levels was found ($p = 0.361$). Owners of a single dog the largest subgroup (51 respondents) exhibited the highest number of good attitudes (28). Although this suggests a positive trend, owners with two to three dogs displayed proportionally similar patterns. Therefore, despite the descriptive differences, the association remained statistically insignificant.

Furthermore, dog age showed a significant association with attitude levels ($p = 0.046$). Respondents with adult dogs exhibited the highest number of moderate attitudes (26). Meanwhile, owners of senior dogs demonstrated a slightly higher frequency of good attitudes (15). Puppy owners, although representing a smaller group, also showed a tendency toward good attitudes (13). Taken together, these findings imply that the age of the dog may influence owners' perspectives and their approach to dental care.

On the other hand, breed type did not demonstrate a significant association with attitude levels ($p = 0.305$). Nonetheless, owners of medium-breed dogs, the largest category (54 respondents) recorded the highest number of moderate attitudes (29). Owners of small-breed dogs also displayed substantial good attitudes (17). However, these descriptive differences were not statistically conclusive.

Lastly, diet type did not show any significant association with attitude ($p = 0.703$). Respondents feeding commercial dry food and those providing mixed diets demonstrated similar distributions across moderate and good attitude categories. Thus, diet choice did not appear to markedly influence owner attitudes regarding canine dental health.

Table 4.7.2 Summary of Associations Between Socio-demographic Variables and the Attitude level

Variable		Attitude Level			Total	Chi Square	P value
		Poor	Moderate	Good			
Age	18–25	0	16	23	39	7.826	0.451
	26–39	3	17	17	37		
	40–59	2	10	6	18		
	60–70	0	3	1	4		
	>71	0	1	1	2		
Gender	Male	5	18	12	35	11.62	0.003
	Female	0	29	36	65		
Race	Indian	3	26	36	65	5.009	0.543
	Chinese	2	15	9	26		
	Malay	0	2	1	3		
	Others	0	4	2	6		
Employment	Civil servant	0	6	7	13	14.149	0.166
	Housewife	0	2	0	2		
	Pensioner	0	3	3	6		
	Private sector	5	22	17	44		
	Student	0	12	21	33		
	Unemployed	0	2	0	2		
Salary	<RM2500	0	4	6	10	7.429	0.491
	>RM10001	1	2	2	5		
	None	0	13	17	30		
	RM2500–RM4850	2	16	10	28		
	RM4850–RM10000	2	12	13	27		
Ownership years	1–3 years	2	12	8	22	12.81	0.046
	4–6 years	2	9	4	15		
	<1 year	0	3	12	15		

	>6 years	1	23	24	48		
Number of dogs owned	1	2	21	28	51	6.586	0.361
	2–3	2	16	17	35		
	4–5	1	5	1	7		
	>5	0	5	2	7		
Dog age	Adult	4	26	20	50	9.685	0.046
	Puppy	0	3	13	16		
	Senior	1	18	15	34		
Breed type	Large	0	6	10	16	4.833	0.305
	Medium	4	29	21	54		
	Small	1	12	17	30		
Diet	Commercial dry	0	16	16	32	3.806	0.703
	Home-cooked	2	11	14	27		
	Mixed	2	17	15	34		
	Wet canned	1	3	3	7		

4.7.3 The Associations Between Socio-demographic Variables and the Practice level

Based on Table 4.7.3, the analysis examining the association between sociodemographic characteristics and practice levels towards canine dental care revealed several important trends. Overall, a significant association was found for age ($p = 0.006$), gender ($p = 0.012$), and breed type ($p = 0.028$), whereas other variables did not reach statistical significance. Nonetheless, descriptive patterns within the non-significant categories provide meaningful insights into respondents' behavioural practices.

To begin with, age demonstrated a statistically significant relationship with practice level ($p = 0.006$). The age group of 18–25 years constituted the largest proportion of respondents and exhibited the highest frequency of moderate practice (21 out of 39), followed by 12 individuals demonstrating good practice. Interestingly, respondents aged 40–59 years displayed poorer levels of practice, with half of them falling into the poor

category (9 out of 18) and none achieving a good practice level. This suggests that younger adults tend to be more proactive in implementing proper dental care practices for their dogs, possibly due to greater exposure to online resources or modern pet-care information.

Gender also showed a significant association with practice levels ($p = 0.012$). Female respondents constituted the majority of the sample (65%) and demonstrated notably stronger practices, with 37 individuals in the moderate category and 19 in the good category. In contrast, a substantial proportion of males fell within the poor practice group (14 out of 35). This pattern indicates that female dog owners may be more consistent in applying recommended dental care practices, which is consistent with findings from other companion-animal health studies that highlight gender differences in caregiving behaviour.

With regard to race, no statistically significant association was observed ($p = 0.683$). Nevertheless, descriptively, Indian respondents who represented the largest racial group also formed the highest number of individuals with moderate (32) and good practice (18). Although this trend is noteworthy, the lack of statistical significance suggests that race was not a determining factor influencing practice behaviours in this study population.

Similarly, employment status was not significantly associated with practice levels ($p = 0.138$). Even so, respondents working in the private sector and students made up the largest subgroups and collectively demonstrated higher frequencies of moderate and good practice. For example, 19 private-sector workers and 20 students reported moderate practice levels. These observations imply that although employment type does not statistically influence practice levels, individuals in certain occupations may still demonstrate more consistent pet-care habits.

With respect to salary levels, no significant association was detected ($p = 0.400$). Respondents without a salary (e.g., students or retirees) formed the largest income category and recorded 19 individuals with moderate and 7 with good practice. However, practices were relatively varied across income groups, suggesting that financial status alone does not reliably predict canine dental care behaviour.

In terms of years of dog ownership, the association was not statistically significant ($p = 0.106$). However, descriptively, individuals who had owned dogs for more than 6 years formed the largest group and showed 26 respondents with moderate practice.

This could indicate that experience contributes to moderate familiarity with dental-care routines, even though the effect was insufficient to reach statistical significance.

Similarly, the number of dogs owned was not associated with practice level ($p = 0.471$). The majority category owners of a single dog displayed the highest number of moderate practices (23 individuals), whereas those owning multiple dogs showed a more varied pattern. This suggests that owning more dogs does not necessarily translate into better or poorer dental-care practices.

Concerning dog age, the association approached significance ($p = 0.057$) but did not meet the threshold. Nonetheless, adult dog owners showed relatively higher moderate practice levels (24 individuals). Owners of puppies and senior dogs demonstrated similar frequencies of good practice (8 and 6, respectively), indicating that practice behaviours may vary depending on the dog's life stage but without a definitive statistical relationship.

Breed type, however, exhibited a significant association with practice level ($p = 0.028$). Owners of medium-breed dogs who constituted the majority group recorded the highest frequency of moderate practice (27) and a considerable number with good practice (10). This suggests that breed size may influence motivation or ability to maintain oral hygiene practices, possibly because medium-breed dogs are often easier to handle compared to large breeds.

Finally, diet type was not significantly associated with practice levels ($p = 0.423$). Despite this, respondents who fed mixed diets ($n = 34$) showed relatively strong practice patterns with 18 moderate and 9 good practices. Owners feeding commercial dry diets also displayed relatively balanced practice levels. Although the association was not statistically significant, these descriptive trends imply that feeding habits may indirectly relate to perceived need or awareness of oral hygiene.

Table 4.7.3 Summary of Associations Between Socio-demographic Variables and the Practice level

Variable		Practice Level			Total	Chi Square	P value
		Poor	Moderate	Good			
Age	18–25	6	21	12	39	21.527	0.006
	26–39	5	20	12	37		
	40–59	9	9	0	18		
	60–70	3	0	1	4		
	>71	0	1	1	2		
Gender	Male	14	14	7	35	8.789	0.012
	Female	9	37	19	65		
Race	Indian	15	32	18	65	3.952	0.683
	Chinese	5	15	6	26		
	Malay	0	2	1	3		
	Others	3	2	1	6		
Employment	Civil servant	4	8	1	13	14.844	0.138
	Housewife	0	1	1	2		
	Pensioner	4	1	1	6		
	Private sector	10	19	15	44		
	Student	5	20	8	33		
	Unemployed	0	2	0	2		
Salary	<RM2500	2	5	3	10	8.355	0.4
	>RM10001	2	2	1	5		
	None	4	19	7	30		
	RM2500–RM4850	6	11	11	28		
	RM4850–RM10000	9	14	4	27		
Ownership years	1–3 years	5	11	6	22	10.476	0.106
	4–6 years	4	7	4	15		
	<1 year	0	7	8	15		
	>6 years	14	26	8	48		

	1	10	23	18	51	5.589	0.471
Number of dogs owned	2 – 3	10	19	6	35		
	4 – 5	1	5	1	7		
	>5	2	4	1	7		
Dog age	Adult	14	24	12	50	9.186	0.057
	Puppy	0	8	8	16		
	Senior	9	19	6	34		
Breed type	Large	5	6	5	16	10.911	0.028
	Medium	17	27	10	54		
	Small	1	18	11	30		
Diet	Commercial dry	6	17	9	32	5.998	0.423
	Home-cooked	10	12	5	27		
	Mixed	7	18	9	34		
	Wet canned	0	4	3	7		

4.8 Correlation Analysis Between Total Knowledge, Attitude And Practice Score

Based on Table 4.8, the correlation analysis between knowledge, attitude, and practice levels demonstrated several statistically significant relationships. To begin with, there was a significant positive correlation between knowledge and attitude ($r = 0.228$, $p = 0.023$), indicating that respondents with higher knowledge scores tended to exhibit more favourable attitudes toward canine dental care. Similarly, knowledge and practice were also significantly correlated ($r = 0.263$, $p = 0.008$), suggesting that greater knowledge was associated with better implementation of recommended practices.

Furthermore, attitude and practice showed a significant positive relationship ($r = 0.236$, $p = 0.018$), implying that respondents with more positive attitudes were more likely to engage in appropriate dental care practices for their dogs. Overall, all three correlations were statistically significant at $p < 0.05$, highlighting a meaningful interdependence among knowledge, attitude, and practice domains within this study population.

Table 4.8 Correlation Analysis Between Total Knowledge, Attitude And Practice Score

Variables	Pearson Correlation Coefficient (r)	p-value
Knowledge - Attitude	0.228	0.023
Knowledge - Practice	0.263	0.008
Attitude - Practice	0.236	0.018
Correlation is significant at $p < 0.05$		

CHAPTER 5

DISCUSSION

This study assessed the knowledge, attitude, and practices (KAP) related to canine dental health among dog owners in Malaysia, involving a total of 100 participants. The sociodemographic profile of respondents provides important context for interpreting the findings. The majority were female (65%), and the most common age group was 18–25 years (39%), indicating that the respondent pool skewed toward young adult pet owners. Malaysians of Indian ethnicity represented the largest proportion (64%), and most participants were employed in the private sector (35%). Despite this, a considerable number reported having no fixed salary (30%), suggesting that financial capacity may influence preventive care decisions.

Dog-ownership characteristics further shaped respondents' perspectives. Nearly half of the participants had been dog owners for more than six years (48%), implying substantial experience with canine care. Most respondents owned a single dog (51%), and adult dogs aged 1–7 years were the most common (50%). Medium-breed dogs constituted the largest group (34%). Dietary practices also varied, with most owners reporting the use of mixed diets (34%), and a substantial proportion (76%) having previously received veterinary advice on general pet care, which would be expected to positively influence knowledge and attitudes.

In terms of knowledge, respondents displayed mixed levels of understanding regarding optimal canine dental care. While many believed that weekly brushing is appropriate (41%), only a minority selected evidence-based recommendations. However, most respondents correctly identified periodontal disease as the most common dental condition in adult dogs (62%). Awareness of age-related onset of dental problems was divided, with 42% selecting "around 3 years" and an equal proportion choosing "5 years or older," reflecting uncertainty about early disease progression. Recognition of clinical signs was relatively strong, with 60% selecting "all of the above" when presented with common indicators such as halitosis, difficulty eating, and drooling. Knowledge related to diet and systemic consequences was also encouraging: 71% identified soft or wet food as a major contributor to plaque build-up, 54% acknowledged systemic impacts on organs such as the heart and kidneys, and 80% correctly defined calculus as hardened plaque capable of

causing gum disease.

Overall, respondents demonstrated a generally positive attitude toward canine dental health. The majority viewed dental care as very important to overall well-being (68%), and 70% indicated willingness to brush their dog's teeth regularly to improve health outcomes. Half of the respondents (50%) were highly concerned about the cost of dental care, and 45% indicated moderate concern, highlighting financial barriers that may influence preventive behaviors. Although 55% believed that regular veterinary dental cleaning is necessary, 39% felt it should only be performed when clinical issues arise. Additionally, more than half of the respondents (52%) rejected the misconception that bad breath is normal in dogs. However, when placed in the context of other preventive health priorities, 42% reported that they would not prioritise dental care, with 40% indicating that prioritisation depends on cost. Most respondents (67%) believed that their dogs enjoy chewing toys or dental treats, suggesting openness to incorporating supportive preventive tools.

Despite generally favourable attitudes, actual preventive practices were insufficient. Forty percent of respondents reported never brushing their dog's teeth, and only 8% performed daily brushing, which remains the gold standard. More than half (53%) did not use any toothpaste, and only 42% used canine-specific formulations. The use of dental chews and toys was more common, with 47% giving them occasionally and 27% regularly, indicating partial adoption of alternative preventive methods. Professional dental cleaning was underutilised: 46% had never taken their dog for such procedures, and only 16% engaged in annual professional cleaning. Monitoring practices were moderate, with 43% checking for dental problems occasionally and 37% performing regular checks. Dietary interventions for dental health showed mixed uptake; only 35% used dental-supportive diets, while the rest were unsure (33%) or did not implement such diets (32%). Importantly, 36% had never received dental-specific veterinary advice, and among those who had, only one-third (34%) consistently followed the guidance provided.

Collectively, these findings demonstrate a discrepancy between positive attitudes and actual preventive practices. While respondents generally recognise the importance of dental care and display adequate foundational knowledge, many fail to translate this awareness into routine preventive behaviours. This gap highlights the need for improved

owner education, increased accessibility of veterinary dental services, and targeted interventions to support long-term oral health in dogs. The following sections will further discuss these patterns in relation to existing literature and their broader implications for canine welfare in Malaysia.

Based on Bloom's criteria, nearly half of the respondents demonstrated good knowledge of canine dental health (46%). This indicates that a substantial proportion of dog owners possess accurate understanding of dental hygiene, disease prevention, and clinical signs of oral problems. However, the remaining respondents fell into moderate (26%) and poor (28%) knowledge categories, suggesting ongoing educational needs. Several sociodemographic variables were significantly associated with knowledge levels. Firstly, age showed a significant relationship ($p = 0.038$), where younger adults, particularly those aged 18–25, had the highest number of respondents achieving good knowledge. This trend aligns with global findings that younger pet owners tend to be more engaged with online pet-care information and veterinary advice (American Veterinary Medical Association, 2020).

Secondly, gender was significantly associated with knowledge ($p = 0.008$), with female respondents displaying higher proportions of good knowledge. Similar gender-related trends have been reported in public health studies, where women consistently show greater engagement in health-seeking behaviours and information acquisition (WHO, 2021). In addition, the salary category exhibited a significant association ($p = 0.023$), with individuals without fixed income (including students and homemakers) showing notably high knowledge levels. Furthermore, years of dog ownership ($p = 0.044$) and dog age ($p = 0.049$) also demonstrated significant associations, suggesting that prolonged experience in pet ownership may enhance knowledge related to dental care.

Despite these significant findings, other variables such as race, employment status, number of dogs owned, breed type, and diet showed no meaningful association with knowledge levels. The attitude domain showed generally positive patterns, with nearly half of respondents categorised as having good attitudes (48%), while the moderate category also accounted for 47%. Only a small minority (4%) displayed poor attitudes, indicating overall favourable perceptions toward canine dental care.

Among the sociodemographic factors, gender emerged as a significant predictor of attitude ($p = 0.003$). Female respondents were more likely to exhibit supportive and preventive attitudes, which is consistent with previous findings that women are often more proactive in preventive healthcare behaviours, including pet care. Moreover, years of dog ownership showed a significant association ($p = 0.046$). Owners with more than six years of experience demonstrated the highest proportion of good attitudes, implying that long-term pet care exposure plays an important role in shaping responsible perspectives.

Similarly, dog age was significantly associated with attitude levels ($p = 0.046$), where owners of senior dogs tended to show stronger attitudes toward preventive care. This reflects an understanding of age-related dental susceptibility, as older dogs are more prone to periodontal disease. Other sociodemographic categories including age, race, employment, salary, number of dogs, breed type, and diet did not show statistically significant associations with attitude levels. Nonetheless, descriptive trends indicated that younger owners and students often displayed positive attitudes, which may reflect higher health awareness and exposure to veterinary guidance.

In contrast to the encouraging knowledge and attitude results, the practice domain highlighted notable gaps. Only 26% of respondents reported good dental care practices, while the majority fell under the moderate category (51%). Importantly, 23% demonstrated poor practices, suggesting a disconnect between awareness and real-life implementation. The variable age was significantly associated with practice levels ($p = 0.006$), with younger respondents again showing more desirable behaviours. Similarly, gender was significantly associated ($p = 0.012$), where females reported better practices than males. These findings mirror public health research indicating that younger and female demographics tend to adopt preventive health practices more readily.

Furthermore, breed type demonstrated a significant association ($p = 0.028$), where medium-breed owners reported higher engagement in dental practices. This could be linked to breed-related predispositions, as medium and large breeds are often highlighted by veterinarians for increased dental disease risk (Harvey, 1998). Other variables such as race, employment status, salary, ownership years, number of dogs, dog age, and diet were

not statistically significant predictors, although descriptive observations suggested that long-term dog owners and those with multiple dogs tended to perform more regular care.

These relationships, albeit modest in strength, suggest that higher knowledge tends to be associated with more positive attitudes, and both in turn are linked to better practice. In other words, while knowledge alone does not guarantee good practice, it contributes together with attitude to more favourable behaviour toward canine dental care. Given the earlier observed "gap" (knowledge & attitude high vs. practice moderate/poor), these correlations reinforce the idea that improving owner knowledge and attitudes remains a critical foundation; but to close the gap, additional supportive measures, motivation tools and routine-building are likely required.

Canine dental health is a critical yet frequently overlooked aspect of companion-animal welfare. Periodontal disease remains the most common oral condition in dogs, affecting an estimated 70–80% of dogs by three years of age (Harvey, 1998). This high prevalence highlights the inherent vulnerability of dogs to dental pathology, particularly when routine preventive care is insufficient. Importantly, poor oral hygiene is not confined to localised dental complications but may lead to significant systemic health impacts. Chronic periodontal infections have been linked to cardiovascular, hepatic, and renal complications due to persistent bacteremia and inflammatory responses (DeBowes, 2018; Cintoni *et al.*, 2020). Such findings underscore the broader clinical relevance of maintaining proper oral health in dogs beyond cosmetic or comfort considerations.

Preventive care, especially regular tooth brushing, has been consistently identified as the gold standard for reducing plaque accumulation and delaying periodontal disease progression. Evidence demonstrates that daily brushing is significantly more effective than intermittent brushing or professional scaling alone in controlling oral bacterial load and gingival inflammation (Gawor *et al*., 2024). A controlled study by (Watanabe *et al*., 2015) further showed that mechanical brushing markedly reduced oral bacterial proliferation in beagle dogs, supporting its role as a primary preventive intervention.

Moreover, studies report that owners who engage in consistent dental care behaviours, such as brushing or providing dental chews, significantly reduce their dogs' risk of developing moderate to severe periodontal disease (Lundgren et al., 2020). This

highlights the need for owner education and behavioural reinforcement, especially considering the well-established gap between knowledge and actual implementation observed in many populations. Overall, contemporary veterinary evidence clearly demonstrates that canine dental health is a vital determinant of long-term wellbeing. The persistent high burden of periodontal disease, combined with its preventable nature, reinforces the importance of ensuring that dog owners not only understand dental care principles but are also supported in applying them consistently in daily practice.

CHAPTER 6

CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION

Canine dental health is increasingly recognised as a major component of overall animal welfare; however, the findings of this study indicate that gaps in knowledge regarding proper dental hygiene persist among Malaysian dog owners. Periodontal disease remains one of the most prevalent health problems in companion animals, with more than 80% of dogs developing some form of periodontal disease by three years of age, highlighting the critical need for improved owner awareness and preventive education (Alessandro et al., 2012). Although general awareness of dental disease exists, comprehensive understanding of its causes, progression, and preventive strategies remains inadequate among many owners.

The attitudes of dog owners towards canine dental health reflect a growing recognition of its importance, yet preventive dental care is often not prioritised until visible clinical signs become apparent. This contributes to delayed intervention despite evidence that periodontal disease is a progressive inflammatory condition affecting the supporting structures of the teeth, leading to oral pain, gingival recession, and tooth loss if left unmanaged. Furthermore, untreated periodontal disease has been associated with systemic complications, including bacteraemia and secondary effects on the cardiovascular, renal, and hepatic systems, reinforcing that dental health is not merely a cosmetic concern but a significant determinant of long-term health and welfare in dogs (Souza et al., 2018; Wallis & Holcombe, 2020).

In terms of preventive practices, this study found that effective dental care measures are not consistently implemented among Malaysian dog owners. Preventive strategies, particularly routine tooth brushing, have been consistently identified as the most effective method for reducing plaque accumulation and gingivitis. Controlled studies have demonstrated that daily tooth brushing significantly reduces plaque and calculus formation compared to mechanical cleaning alone, and that owner-implemented home-care routines play a crucial role in slowing the progression of periodontal disease (Santos et al., 2019).

Nevertheless, many owners continue to rely on alternative measures or delay seeking veterinary care until dental disease has advanced.

The findings further suggest that inadequate knowledge, misconceptions regarding the progression of dental disease, and limited emphasis on preventive care are key factors influencing poor attitudes and practices. Untreated dental disease imposes substantial economic and welfare burdens, as advanced periodontal disease often requires costly veterinary interventions, including professional scaling, tooth extractions, and long-term management. This underscores the importance of early prevention and active owner engagement, particularly in Malaysia, where awareness of routine dental care for companion animals is still developing.

Overall, evidence from current veterinary dentistry research demonstrates that good oral hygiene is essential for preventing disease progression, reducing pain and discomfort, improving quality of life, and lowering veterinary treatment costs (Alessandro et al., 2012; Santos et al., 2019; Wallis & Holcombe, 2020). The findings of this Knowledge, Attitude, and Practice (KAP) study highlight the need to strengthen owner education, promote positive attitudes, and encourage consistent preventive dental practices among Malaysian dog owners to improve long-term canine health and welfare.

6.2 RECOMMENDATION

Based on the findings of this study, several key recommendations can be proposed to strengthen canine dental health practices among dog owners in Malaysia. Although many respondents demonstrated good levels of knowledge and positive attitudes, there remains a clear gap between awareness and actual behavioural practice. Therefore, efforts must not only focus on providing information but also on enabling and motivating owners to translate that information into consistent dental-care routines.

Firstly, greater emphasis should be placed on accessible and continuous public education. While owners generally understand the importance of dental care, many still do not engage in regular brushing or preventive routines. Educational initiatives delivered through veterinary clinics, animal welfare organisations, grooming centres, and online platforms could help reinforce the importance of oral hygiene. Simple strategies such as

video demonstrations, infographics, and veterinarian-led social media campaigns can make dental care appear less intimidating and more manageable for the average owner. Empowering owners with practical knowledge such as how to introduce brushing gradually or how to choose the right dental products can facilitate more consistent adoption of healthy habits.

In addition, supporting owners with tools and practical resources may help bridge the knowledge–practice gap. Many owners find daily brushing challenging due to time constraints, lack of confidence, or difficulty handling the dog. Providing owner-friendly dental kits, promoting alternative cleaning methods like dental wipes or dental chews, and encouraging clinics to offer periodic dental check-up packages may ease the burden. When preventive care is made convenient and accessible, owners are more likely to integrate it into their routine.

Another key recommendation is to strengthen the role of veterinarians in early detection and preventive counselling. Routine veterinary visits should include brief oral examinations and personalised advice tailored to each dog's age, breed, and risk level. By integrating dental assessment into regular check-ups, veterinarians can identify issues before they become severe and reinforce consistent home-care practices. Veterinarians should also take the opportunity to correct misconceptions, emphasise the consequences of untreated dental disease, and provide realistic expectations about maintenance.

Furthermore, long-term dog owners demonstrated significantly better attitudes and practices, suggesting that experience plays an important role in shaping behaviour. To support newer or first-time dog owners, targeted orientation programmes or informational pamphlets at the point of adoption or purchase could be beneficial. Early reinforcement of dental-care habits is particularly important, as establishing routines during puppyhood significantly increases long-term compliance.

Finally, community-level initiatives may also offer meaningful impact. Animal shelters, pet adoption campaigns, and community outreach activities could incorporate dental health awareness into their programmes. Public spaces, such as dog parks or community centres, may serve as venues for workshops or demonstration sessions. These activities not only raise general awareness but also normalise conversations about dental care among dog owners, encouraging peer learning and shared responsibility.

In conclusion, improving canine dental health in Malaysia requires a multi-dimensional approach that goes beyond enhancing knowledge alone. By combining accessible education, supportive resources, veterinary engagement, and community involvement, the gap between understanding and practical behaviour can be narrowed. Strengthening these components will ultimately promote better oral health outcomes for dogs and contribute to overall animal welfare in the country.

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APPENDIX

8.1 Appendix 1: Human Ethics Approval Form

UNIVERSITI MALAYSIA KELANTAN
Kampus Kota, 16100 Kota Bharu, Kelantan, Malaysia.
www.umk.edu.my Tel : 09-7717000/7281

FAKULTI PERUBATAN VETERINAR
Faculty of Veterinary Medicine

Ruj. Kami (*Our Ref.*) : UMK.A06.800-1/2/9 (08)
Tarikh (*Date*) : 30th NOVEMBER 2025

DR. MOHAMMED DAUDA GONI
Principal Investigator
Faculty of Veterinary Medicine
University Malaysia Kelantan

Dear Dr.,

APPROVAL OF INSTITUTIONAL HUMAN CARE AND USE COMMITTEE TO CONDUCT RESEARCH INVOLVING HUMAN

We are pleased to inform you that your application for approval to conduct research from Institutional Human Care and Use Committee, Faculty of Veterinary Medicine, Universiti Malaysia Kelantan has been approved with the following code:

Approval Code	***UMK/FPV/HUMAN/EXT/0008/2025***
Title	***Assessment of Knowledge, Attitude, and Practice Regarding Canine Dental Health Among Dog Owners in Malaysia***
Student Principal Investigator:	**Shivaani A/P Sunmugam – D21B0138**

You are advised to always follow "3R" (REDUCE, REFINE, & REPLACE) and all human ethics and human welfare principles to reduce suffering in human.

Thank you.

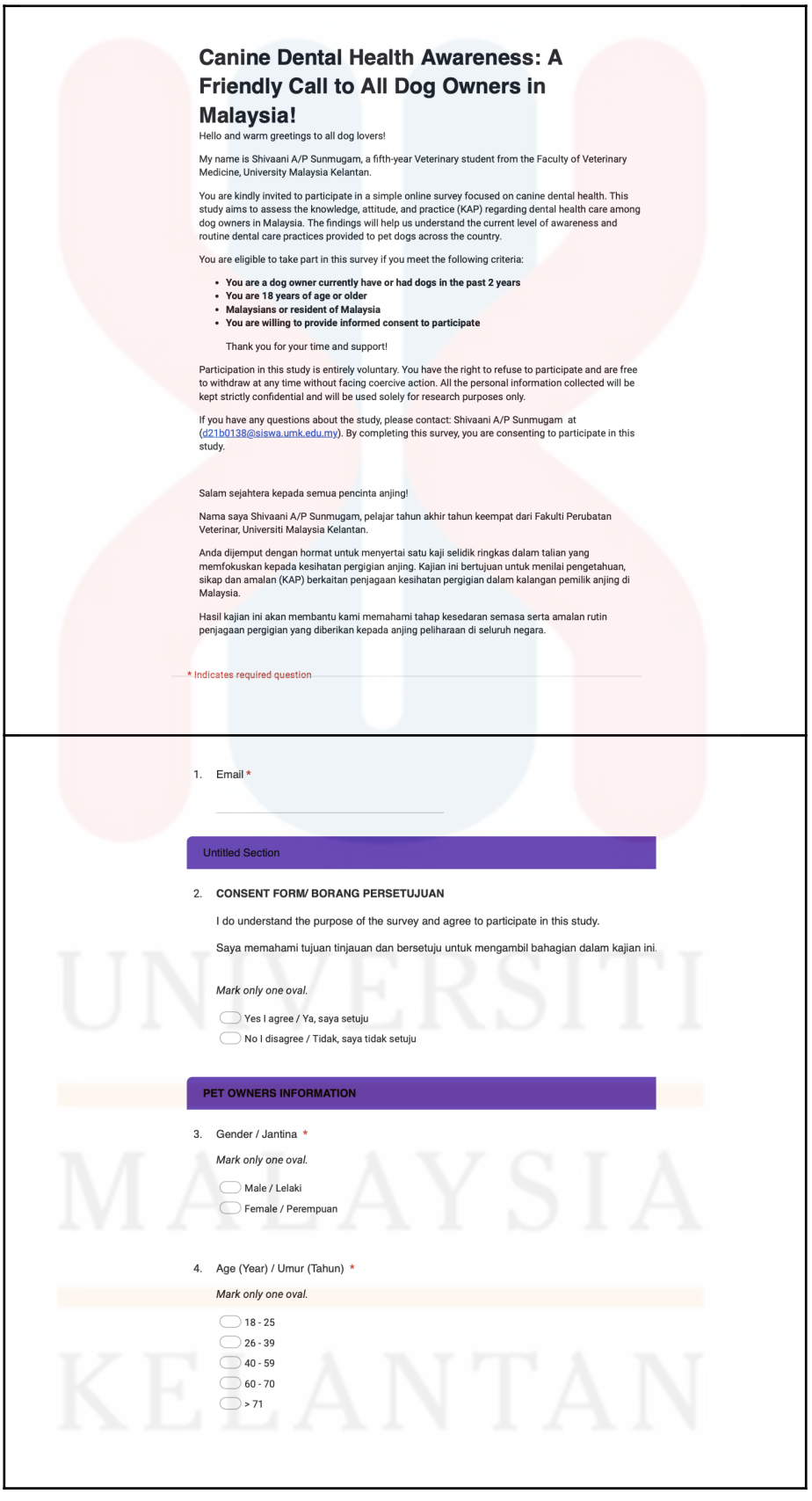
"BERKHIDMAT UNTUK NEGARA"

Yours sincerely,

(DR. ABUBAKAR DAN MAIGORO)
Chairman
Institutional Human Care and Use Committee

Ira/Kelulusan Etika Penglibatan Manusia Dalam Penyelidikan/MyDrive

8.2 Appendix 2: Google Survey Questionnaire



Canine Dental Health Awareness: A Friendly Call to All Dog Owners in Malaysia!

Hello and warm greetings to all dog lovers!

My name is Shivaani A/P Sunmugam, a fifth-year Veterinary student from the Faculty of Veterinary Medicine, University Malaysia Kelantan.

You are kindly invited to participate in a simple online survey focused on canine dental health. This study aims to assess the knowledge, attitude, and practice (KAP) regarding dental health care among dog owners in Malaysia. The findings will help us understand the current level of awareness and routine dental care practices provided to pet dogs across the country.

You are eligible to take part in this survey if you meet the following criteria:

- **You are a dog owner currently have or had dogs in the past 2 years**
- **You are 18 years of age or older**
- **Malaysians or resident of Malaysia**
- **You are willing to provide informed consent to participate**

Thank you for your time and support!

Participation in this study is entirely voluntary. You have the right to refuse to participate and are free to withdraw at any time without facing coercive action. All the personal information collected will be kept strictly confidential and will be used solely for research purposes only.

If you have any questions about the study, please contact: Shivaani A/P Sunmugam at (d21b0138@siswa.umk.edu.my). By completing this survey, you are consenting to participate in this study.

Salam sejahtera kepada semua pencinta anjing!

Nama saya Shivaani A/P Sunmugam, pelajar tahun akhir tahun keempat dari Fakulti Perubatan Veterinar, Universiti Malaysia Kelantan.

Anda dijemput dengan hormat untuk menyertai satu kaji selidik ringkas dalam talian yang memfokuskan kepada kesihatan pergigian anjing. Kajian ini bertujuan untuk menilai pengetahuan, sikap dan amalan (KAP) berkaitan penjagaan kesihatan pergigian dalam kalangan pemilik anjing di Malaysia.

Hasil kajian ini akan membantu kami memahami tahap kesedaran semasa serta amalan rutin penjagaan pergigian yang diberikan kepada anjing peliharaan di seluruh negara.

* Indicates required question

1. Email *

Untitled Section

2. **CONSENT FORM/ BORANG PERSETUJUAN**

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.

Mark only one oval.

- Yes I agree / Ya, saya setuju
- No I disagree / Tidak, saya tidak setuju

PET OWNERS INFORMATION

3. Gender / Jantina *

Mark only one oval.

- Male / Lelaki
- Female / Perempuan

4. Age (Year) / Umur (Tahun) *

Mark only one oval.

- 18 - 25
- 26 - 39
- 40 - 59
- 60 - 70
- > 71

5. Race / Bangsa *

Mark only one oval.

- ( ) Malay
- ( ) Chinese
- ( ) Indian
- ( ) Other: _____

6. Employment status / Status Pekerjaan *

Mark only one oval.

- ( ) Civil servant/ Penjawat awam
- ( ) Self employed / Bekerja sendiri
- ( ) Private sector / Sektor Swasta
- ( ) Pensioner / Pesara
- ( ) Housewife / Suri rumah
- ( ) Student / Pelajar
- ( ) Unemployed / Tidak bekerja
- ( ) Other: _____

7. Salary / Pendapatan *

Mark only one oval.

- ( ) < RM 2500
- ( ) RM 2500 - RM 4850
- ( ) RM 4850- RM 10,000
- ( ) > RM 10,001
- ( ) none / Tiada

---

8. How many years have you been a dog owner? *
Berapa tahun anda telah menjadi pemilik anjing?

Mark only one oval.

- ( ) Less than 1 year / Kurang daripada 1 tahun
- ( ) 1–3 years / 1–3 tahun
- ( ) 4–6 years / 4–6 tahun
- ( ) More than 6 years / Lebih daripada 6 tahun

9. How many dogs do you have/had own? *
Berapa ekor anjing yang anda sedang/telah miliki ?

Mark only one oval.

- ( ) 1
- ( ) 2–3
- ( ) 4–5
- ( ) More than 5 / Lebih daripada 5

10. What is the age of your dog(s)? (select all that apply) *
Berapakah umur anjing anda? (pilih semua yang berkaitan)

Mark only one oval.

- ( ) Puppy (<1 year) / Anak anjing (<1 tahun)
- ( ) Adult (1–7 years) / Dewasa (1–7 tahun)
- ( ) Senior (>7 years) / Warga emas (>7 tahun)

11. What breed type is your dog(s)? *
Apakah jenis baka anjing anda?

Mark only one oval.

- Small breed / Baka kecil
- Medium breed / Baka sederhana
- Large breed / Baka besar
- Mixed breed / Baka campuran

12. What is the primary diet of your dog(s)? *
Apakah diet utama anjing anda?

Mark only one oval.

- Commercial dry food (kibble) / Makanan kering komersial
- Wet canned food / Makanan tin
- Raw diet / Diet mentah
- Home-cooked food / Makanan dimasak di rumah
- Mixed / Campuran

13. Have you ever received advice from a veterinarian regarding general pet care?
Pernahkah anda menerima nasihat daripada doktor veterinar mengenai penjagaan umum haiwan peliharaan?

Mark only one oval.

- Yes / Ya
- No / Tidak

Knowledge / Pengetahuan (7 Questions)

14. **How often should a dog's teeth be brushed for optimal dental health?** *
Berapa kerap gigi anjing perlu diberus untuk kesihatan pergigian yang optimum?

Mark only one oval.

- Daily / Setiap hari
- Once a week / Sekali seminggu
- Once a month / Sekali sebulan
- Only when visibly dirty / Hanya apabila kelihatan kotor

15. **What is the most common dental disease in adult dogs?** *
Apakah penyakit pergigian yang paling biasa pada anjing dewasa?

Mark only one oval.

- Periodontal disease / Penyakit periodontal
- Oral cancer / Kanser mulut
- Broken teeth / Gigi patah
- Gingival hyperplasia / Hiperplasia gusi

16. **At what age do most dogs start to develop signs of dental disease if no preventive care is given?**
Pada umur berapa kebanyakan anjing mula menunjukkan tanda-tanda penyakit pergigian jika tiada penjagaan pencegahan?

Mark only one oval.

- Under 1 year / Bawah 1 tahun
- Around 3 years / Sekitar 3 tahun
- 5 years or older / 5 tahun atau lebih
- Never / Tidak pernah

17. **Which of the following is a sign of dental disease in dogs?** *
Yang manakah berikut adalah tanda penyakit pergigian pada anjing?

Mark only one oval.

- Bad breath / Nafas berbau
- Difficulty eating / Kesukaran makan
- Drooling or pawing at the mouth / Air liur berlebihan atau menggaru mulut
- All of the above / Semua di atas

18. **Which food type is more likely to contribute to plaque build-up?** *
Jenis makanan yang manakah lebih cenderung menyebabkan pembentukan plak?

Mark only one oval.

- Soft/wet canned food / Makanan lembut atau basah dalam tin
- Dry kibble / Makanan kering
- Raw bones / Tulang mentah
- None, diet does not affect plaque / Tiada, diet tidak mempengaruhi plak

19. **Can untreated dental disease in dogs affect other organs (heart, kidney, liver)?**
Bolehkah penyakit pergigian yang tidak dirawat menjejaskan organ lain (jantung, buah pinggang, hati)?

Mark only one oval.

- Yes / Ya
- No / Tidak
- Not sure / Tidak pasti

20. **What is dental calculus (tartar)?** *
Apakah itu kalkulus pergigian (karang gigi)?

Mark only one oval.

- A harmless stain on the teeth / Kesan pada gigi yang tidak berbahaya
- Hardened plaque that can cause gum disease / Plak yang mengeras dan boleh menyebabka penyakit gusi
- A natural protective coating on teeth / Lapisan pelindung semula jadi pada gigi
- A tooth infection / Jangkitan gigi

Attitude / Sikap (7 Questions)

21. **How important do you think dental care is for your dog's overall health?**
Sejauh mana anda fikir penjagaan pergigian penting untuk kesihatan keseluruhan anjing anda?

Mark only one oval.

- Very important / Sangat penting
- Somewhat important / Agak penting
- Not important / Tidak penting

22. **Would you be willing to brush your dog's teeth regularly if it improved their health?**
Adakah anda sanggup memberus gigi anjing anda secara berkala jika ia meningkatkan kesihatannya?

Mark only one oval.

- Definitely yes / Sudah tentu ya
- Maybe / Mungkin
- No / Tidak

23. **Do you believe professional dental cleaning by a veterinarian is necessary?** *
Adakah anda percaya pembersihan gigi profesional oleh doktor veterinar adalah perlu?

Mark only one oval.

- ◯ Yes, regularly / Ya, secara berkala
- ◯ Only if there's a problem / Hanya jika ada masalah
- ◯ Not necessary / Tidak perlu

24. **How concerned are you about the cost of dental care for your dog?** *
Sejauh mana anda bimbang tentang kos penjagaan pergigian untuk anjing anda?

Mark only one oval.

- ◯ Very concerned / Sangat bimbang
- ◯ Somewhat concerned / Agak bimbang
- ◯ Not concerned / Tidak bimbang

25. **Do you think bad breath in dogs is normal and not a cause for concern?**
Adakah anda fikir nafas berbau pada anjing adalah perkara biasa dan tidak perlu dibimbangkan?

Mark only one oval.

- ◯ Yes / Ya
- ◯ No / Tidak
- ◯ Not sure / Tidak pasti

26. **Would you prioritise dental care over other preventive measures (like flea/tick prevention)?**
Adakah anda akan mengutamakan penjagaan pergigian berbanding langkah pencegahan lain (seperti pencegahan kutu/flea)?

Mark only one oval.

- ◯ Yes / Ya
- ◯ No / Tidak
- ◯ Depends on cost / Bergantung pada kos

27. **Do you believe your dog enjoys chewing toys or treats that help clean their teeth?**
Adakah anda percaya anjing anda suka mengunyah mainan atau snek yang membantu membersihkan giginya?

Mark only one oval.

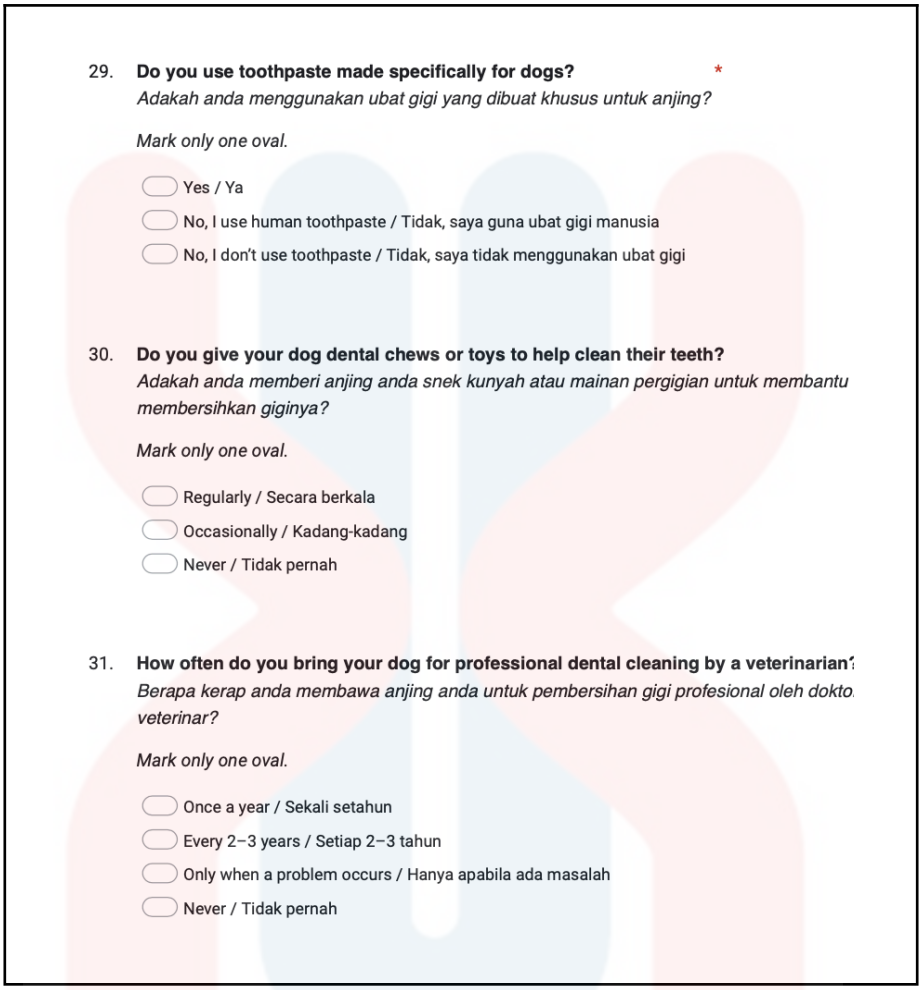
- ◯ Yes / Ya
- ◯ No / Tidak
- ◯ Not sure / Tidak pasti

Practice / Amalan (7 Questions)

28. **How often do you brush your dog's teeth?** *
Berapa kerap anda memberus gigi anjing anda?

Mark only one oval.

- ◯ Daily / Setiap hari
- ◯ Weekly / Setiap minggu
- ◯ Monthly / Setiap bulan
- ◯ Never / Tidak pernah



29. **Do you use toothpaste made specifically for dogs?** *
Adakah anda menggunakan ubat gigi yang dibuat khusus untuk anjing?

Mark only one oval.

- Yes / Ya
- No, I use human toothpaste / Tidak, saya guna ubat gigi manusia
- No, I don't use toothpaste / Tidak, saya tidak menggunakan ubat gigi

30. **Do you give your dog dental chews or toys to help clean their teeth?**
Adakah anda memberi anjing anda snek kunyah atau mainan pergigian untuk membantu membersihkan giginya?

Mark only one oval.

- Regularly / Secara berkala
- Occasionally / Kadang-kadang
- Never / Tidak pernah

31. **How often do you bring your dog for professional dental cleaning by a veterinarian?**
Berapa kerap anda membawa anjing anda untuk pembersihan gigi profesional oleh dokto veterinar?

Mark only one oval.

- Once a year / Sekali setahun
- Every 2–3 years / Setiap 2–3 tahun
- Only when a problem occurs / Hanya apabila ada masalah
- Never / Tidak pernah

8.3 Appendix 3 : Cronbach's Alpha Results

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.803	.803	20