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ASSESSMENT OF ORAL HEALTH STATUS AMONG THE WORKING BREED DOGS IN CHENNAI CITY: A HOSPITAL BASED SURVEY

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ABSTRACT

BACKGROUND: Nearly four out of five dogs suffer from oral health problems like bad breath, swollen and bleeding gums. The myth of domestic animal's oral health is least important than their physical health should be broken. This study demonstrates and justifies how much role oral hygiene plays in maintaining dogs' general health status. This study aims to assess the oral health status among the working breed dogs in chennai city.

MATERIALS AND METHOD: An observational cross-sectional study was conducted among 60 working dog breeds which belong to kanni and boxer breeds. The study was conducted in various veterinary hospitals and India's blue cross in Chennai based on the simple random sampling method. Their oral health status was assessed by direct visual examination and by using questionnaires regarding demographic data, systemic disease, tooth brushing, and vaccination status. The data were analyzed and tabulated using descriptive statistics and chi-square tests. P-value < 0.05 was considered to be statistically significant.

RESULTS: The results of the study showed that majority of kanni and boxer breed had a normal malocclusion (37.3% and 40.7%). A good periodontal status (38.3%) were seen among kanni and boxer breed. The prevalence of dental caries among boxer and kanni breed is 78% and 22% respectively. While assessing the plaque index, majority of the working breed had small flecks of plaque.

CONCLUSION: A positive association between the malocclusion, periodontal status, missing and fractured tooth was noticed with a P-value of <0.05. The disregard towards the oral hygiene maintenance of dogs must come to an end. The awareness about poor oral hygiene leading to cause systemic effects in dogs must be put in the light.

KEYWORDS: Oral health, working dogs, malocclusion, dental caries, plaque, periodontal disease.

INTRODUCTION

Human - canine bonding is a beautiful relationship in the whole world, depicting the love between humans and dogs. For centuries, dogs have been man's best companion and friend, offering loads of love and loyalty to their human counterparts. Of course, we humans live with cats, work with horses, hire cows for milk, chickens for their eggs, and pay them with food - unless we kill them and eat them instead. But with dogs, things are always different. Our world is swirled together with their world like two different shades of paint; that is, once you have commingled into orange, there is no going back to red and yellow again. This study concentrates more on working dog breeds.

A working dog breed is a dog used to perform practical tasks, as opposed to pet or companion dogs. They are also described as a dog whose breed habitats or physical characteristic lend itself to working irrespective of an individual animal's training or employment. Types of working dogs are classified based on their roles, which includes assistant, guide, guard, detection, herding, and therapy dogs. Many of these dogs act as guards, but as long as they are properly socialized, they can be super friendly. The study was mainly focused on kanni and boxer breeds upon their oral and dental hygiene status[1].

As western civilization progressed, the diet chart we consumed earlier has changed, and it includes food types that would promote decay and became a serious concern now. But the recent use of dental fluorides and improved oral hygiene practices has brought a decline in the incidence of caries in humans. All reasons mentioned above do apply to even pets and especially dogs. Oral disease is said to be an important factor in determining the health status of a dog. Recently some studies showed a close association of these disorders with the general health of the animal. Many factors contribute to the pet's oral health status, and the owners may influence some of these. It is known that diet and level of oral homecare or owner-controlled factors play a role in determining dogs' oral health status. The type of food consumed by a dog also plays a role in their

oral health status; uncontrolled plaque accumulation and gingivitis may lead to severe periodontitis and tooth loss[2].

Many dog owners have zero knowledge about oral diseases and their causes in their pets, and some are even unaware that even dogs can be subjected to caries. Even though caries in dogs are very less compared to humans, it does occur and must watch for high caries risk areas and undergo following preventive or restorative treatments, respectively. The most favorable factors which help caries to occur in a place are the natural tooth surface, which is exposed more to the oral environment, complex indigenous microflora, and diet is taken through the mouth. There are some other modifying factors also which influence the location of the lesion to occur. The reasons why our canine friends have a lower incidence of caries are; conical tooth shape and wider inter-dental spacing with less area for food impaction and stagnation; less carbohydrate-containing diet, and also higher salivary pH (7.5)[3].

Malocclusion in dogs involves an abnormal relationship of the teeth to each other and other oral structures. To detect a malocclusion, it is important to understand both normal occlusions and of the classification and terms associated[4]. As there is a malocclusion in humans, it is also found in dogs, classified as Class I Malocclusion, Class II Malocclusion, and Class III Malocclusion.

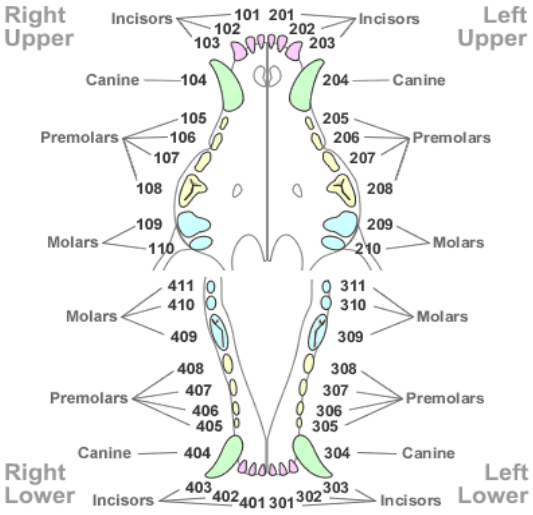
Gingivitis in dogs is an inflammation of gums, and the early stage of gum disease is called periodontal disease. Unlike humans, it is very common in dogs and is treatable. The gingivitis is caused by bacteria that accumulate due to plaque and tartar build-up. This is preventable in dogs with regular at-home brushing and occasional professional teeth cleaning. However, many dog owners do not give enough thought to the dog's dental health[5].

Dental plaque has been implicated as a potential reservoir of H.pylori, and it has also been detected in saliva. It is the sticky yellow to tan colored material that forms within 3-24hrs after tooth cleaning. The prevalence of periodontal disease increases with aging in all dogs. No previous studies have been conducted regarding the oral health status of the working dog breeds in India. Hence this present study aims to analyze the oral health status of working breed dogs[6].

MATERIALS AND METHOD

The study was conducted in Sai Pet Care Hospital, Auro-multispeciality pet hospital, and blue cross. The oral hygiene status of the dogs was assessed by our team. We used wooden ice cream sticks and disposed of it after screening every single dog. Our study was ethically approved by our faculty of the Department of Public Health Dentistry, SRM Dental College, Ramapuram. This study is all about domestic animals; that is, it includes only the individuals who wanted their domestic animals to be part of this study. Every pet owner is made to fill a consent form, and those who didn't fulfill the consent form were excluded from the study. This study was conducted among 48 working dog breeds. Some dogs were so friendly that we examined ourselves while the other dogs were held back by either their owners or the pet care hospital staff so that a quick examination of their oral cavity was done for our study. The other set of dogs was so aggressive in nature that they were not examined by staying too close.

The modified Triadan system provides a consistent method of numbering teeth across different animal species. This system is based on permanent dentition.



As soon the oral cavity was visualized, plaque and calculus covering the tooth was the first thing to be noticed, so the plaque index we used was the Turesky Plaque Index(1970), which was a modification of Quigley and Hein PI(962), the grading system had scored from 0 to 5. Score 0 implies no plaque accumulation, score 1 implies small flecks of calculus at gingival margin level, score 2 implies a thin band of calculus up to 1mm, score 3 implies a band of calculus more than 1mm but not covering 1/3rd of crown structure, grade 4 implies calculus covering more than 1/3rd but less than 2/3rd of crown structure, grade 5 implies calculus covering more than 2/3rd of the crown structure. The calculus status of dogs are classified based under canine calculus score index from 0 to 3, score 0 shows no observable calculus, score one shows scattered calculus covering less than 1/3rd of the crown, score 2 shows calculus covering between 1/3rd and 2/3rd of the crown and score 3 shows calculus covering more than 2/3rd of the crown.

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The periodontal status of the working dog breeds was recorded using the visual periodontal disease assessment tool, which was based on American Veterinary Dental College (AVDC). The lips and cheeks were retracted to visualize the teeth and gingiva. The forceful mouth opening was not done so that it can induce stress in dogs. The scale was rated from 0-4, grade 0 indicates a good oral health status with no signs of periodontal tissue damage, grade 1 indicates redness of gingival margin with the associated tooth, grade 2 indicates redness of gingival margin with the associated tooth, grade 3 indicates mild periodontitis in addition to redness and edema, grade 4 indicates severe periodontitis with a loosening of teeth.

Dental caries for dogs was basically classified under two categories; pits and fissure caries and smooth surface caries. Under smooth surface caries, the three-tooth surfaces involved are the proximal surface, buccal surface, and lingual surface.

According to the American Kennel Club (AKC) breed standards, the breeds were classified as brachycephalic, mesocephalic, and dolichocephalic to evaluate the relationship between skull morphology and severity of periodontal diseases. The American Veterinary Dental College (AVDC) uses three symmetrical malocclusions in dogs, class 1 malocclusion, also called neutroclusion, where jaw length is the same but less than 4 teeth are in an abnormal position, class 2 malocclusion, also called mandibular distoclusion, where mandible is positioned backward (distal) to its maxilla, and class 3 malocclusion also called mandibular mesiooclusion where the mandible is positioned forward (mesial) to its maxilla. However, this condition is normal in brachycephalic breeds.

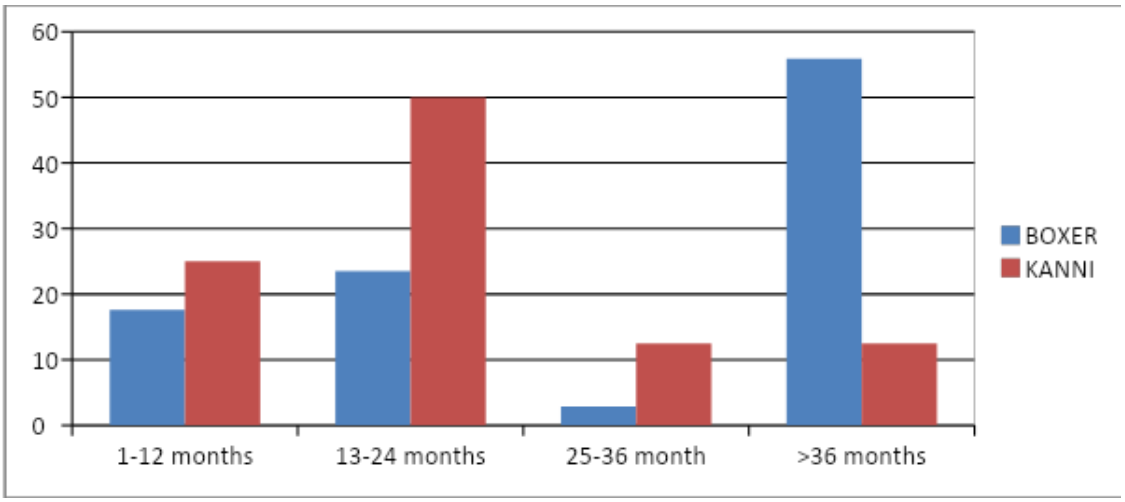
RESULTS

TABLE 1: DISTRIBUTION OF AGE IN WORKING BREED OF DOGS

S.No	Age distribution	Boxer breed	Kanni breed
1.	1-12 months	0	25%
2.	13-24 months	85.7	50%
3.	25-36 months	14.3	12.5%
4.	>36 months	0	12.5%

Table 1 shows the age distribution among the working breed of dogs. The percentage distribution among the boxer breed was much higher in 13-24 months group, which is 88.9%. Among the Kanni breed, 50% of dogs were under the age group of 13-24 months.

GRAPH 1: AGE DISTRIBUTION BETWEEN THE WORKING BREED OF DOGS



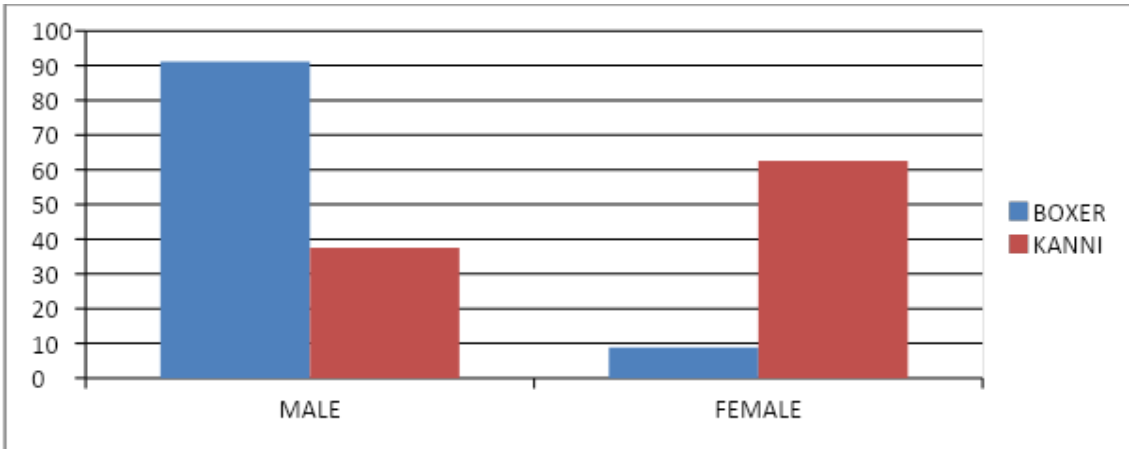
Graph 1 shows the age distribution among the working breed in graphical representation. The graph illustrates that a higher percentage of dogs were under the age group of >36 months, which were found in boxer breed type of dogs.

TABLE-2: DISTRIBUTION OF GENDER IN WORKING BREED OF DOGS

S.No	Gender distribution	Boxer breed	Kanni breed
1.	Male	71	37.5%
2.	Female	29	62.5%

Table 2 shows the gender distribution among the working breed of dogs. Among the boxer breed, 71% were males, and 29% were females. In the Kanni breed, the male and female were 37.5% and 62.5%, respectively.

GRAPH 2: GENDER DISTRIBUTION BETWEEN THE WORKING BREED OF DOGS



Graph 2 shows gender distribution among the working breed in graphical representation. The graph illustrates that a higher percentage of dogs were under males of boxer breed of dog.

TABLE 3: PERCENTAGE DISTRIBUTION OF ORAL HEALTH STATUS AMONG THE WORKING BREEDS OF DOGS

S no	Variables	Boxer breed	Kanni breed
		%	%
1	Systemic Disease	72.1	27.9
2	Teeth brushed	61.6	38.4
3	Gingivitis	58.4	41.6
4	Oral lesions	63.9	36.1
5	Attrition	54.5	45.5
6	Missing teeth	55.7	44.3
7	Dental caries	63.2	36.8
8	Calculus	54.8	45.2
9	Stains	78.2	21.8
10	Periodontitis	43.9	56.1
11	Fractured teeth	61.5	38.5
12	Malocclusion	82.1	17.9

Table 3 shows the percentage distribution among the oral health status among the working breed of dog. Among the distribution, more percentage of oral health problems were reported in the boxer breed of dog as malocclusion followed by stains in boxer breed of dog.

TABLE 4: ASSOCIATION OF ORAL HEALTH STATUS AMONG WORKING BREED OF DOG

S no.	Variable	P-value
1.	Systemic diseases	0.45

2.	Teeth brushed	0.62
3.	Gingivitis	0.01*
4.	Oral lesion	0.07
5.	Attrition	0.48
6.	Missing teeth	0.15
7.	Dental caries	0.09
8.	Calculus	0.38
9.	Stains	0.04*
10.	Periodontitis	0.10
11.	Fractured teeth	0.058
12.	Malocclusion	0.001*

Table 4 shows the association of oral health status between the working breed of dog. P-value <0.05 was considered to be statistically significant. A significant difference was obtained among the gingivitis, stains, and malocclusion among the working breed of dog.

TABLE 5: DISTRIBUTION OF MALOCCLUSION AMONG THE WORKING BREED OF DOGS

S.No	Malocclusion	Boxer breed	Kanni breed	P-value
1.	Class 1	37.3%	40.7%	0.001*
2.	Class 2	6.8%	6.8%	
3.	Class 3	5.1%	3.4%	

Table 5 shows the percentage distribution among the malocclusion status among the working breed of dog. Among the distribution, the majority were under the class 1 malocclusion, which was 37.3 % and 40.7% in boxer and Kanni breed.

GRAPH 3: MALOCCLUSION STATUS BETWEEN THE WORKING BREED OF DOGS

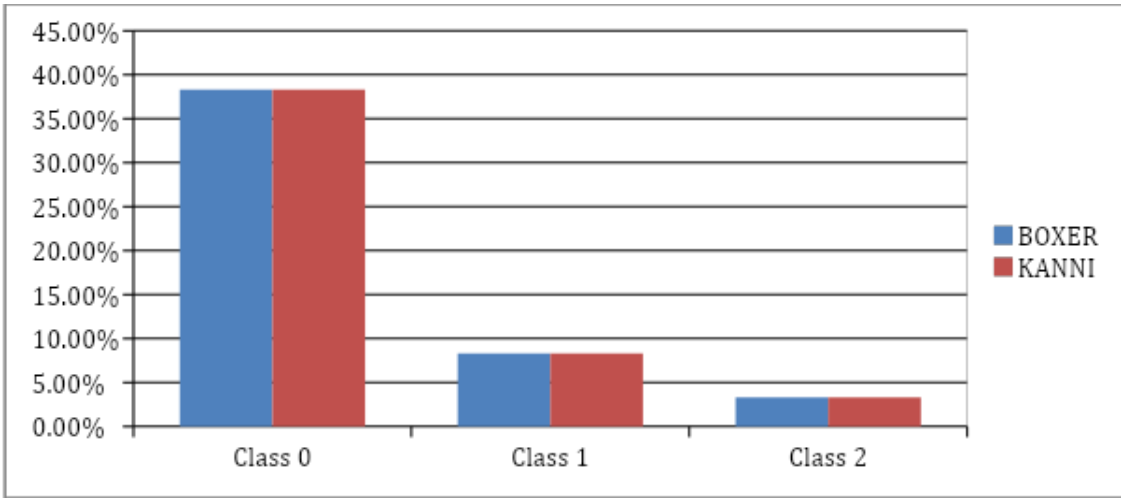
Graph 3 shows the malocclusion status between the working breed of dogs. The majority of the distribution was found in the Kanni breed of class 1, which was 40.7%, and least was seen among the Kanni breed of class 3, which was 3.4%.

TABLE 6: DISTRIBUTION OF PERIODONTAL STATUS AMONG THE WORKING BREED OF DOGS

S.No	Periodontal classification	Boxer breed	Kanni breed	P-value
1.	Class 0	38.3%	38.3%	0.001*
2.	Class 1	8.3%	8.3%	
3.	Class 2	3.3%	3.3%	
4.	Class 3	0%	0%	
5.	Class 4	0%	0%	
6.	Class 5	0%	0%	

Table 6 shows the percentage distribution among the periodontal status among the working breed of dog. Among the distribution, the majority were under the class o o, which was 38.3 % among the boxer and Kanni breed.

GRAPH 4: PERIODONTAL STATUS BETWEEN THE WORKING BREED OF DOGS



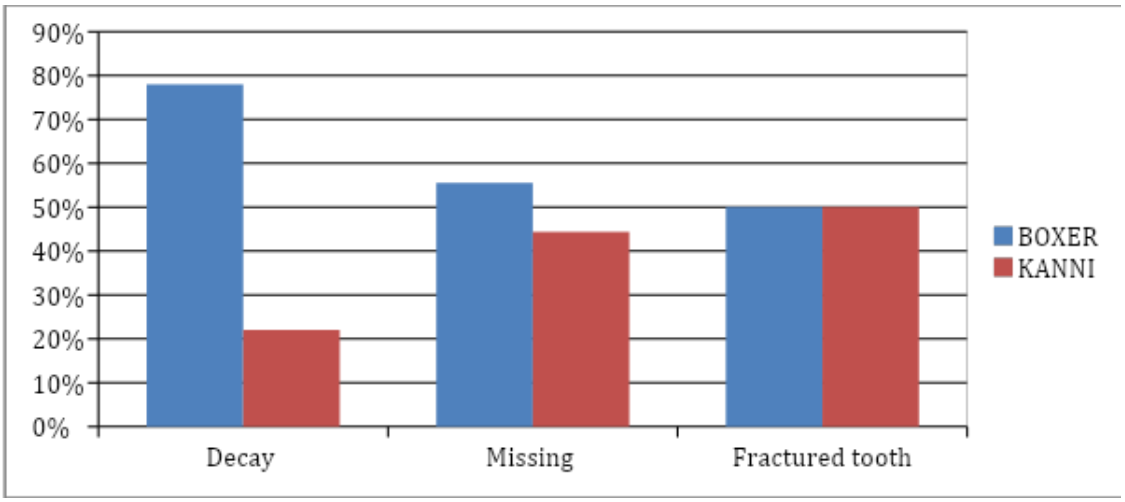
Graph 4 shows the periodontal status between the working breed of dogs. The majority of the distribution was found in the Kanni and boxer breed of class 0, which was 38.3.%, and least was seen among the Kanni and boxer breed of class 2, which was 3.3%.

TABLE 7: DISTRIBUTION OF DENTITION STATUS AMONG THE WORKING BREED OF DOGS

S.No	Dentition status	Boxer breed	Kanni breed	P-value
1.	Decay	78%	22%	0.715
2.	Missing	55.6%	44.4%	0.039*
3.	Fractured tooth	50%	50%	0.001*

Table 7 shows the percentage distribution among the dentition status among the working breed of dog. Among the distribution, the majorities were under the boxer breed of decay status, which was 78%, and least were seen among the Kanni breed, which was 44.4%.

GRAPH 5: DENTITION STATUS BETWEEN THE WORKING BREED OF DOGS



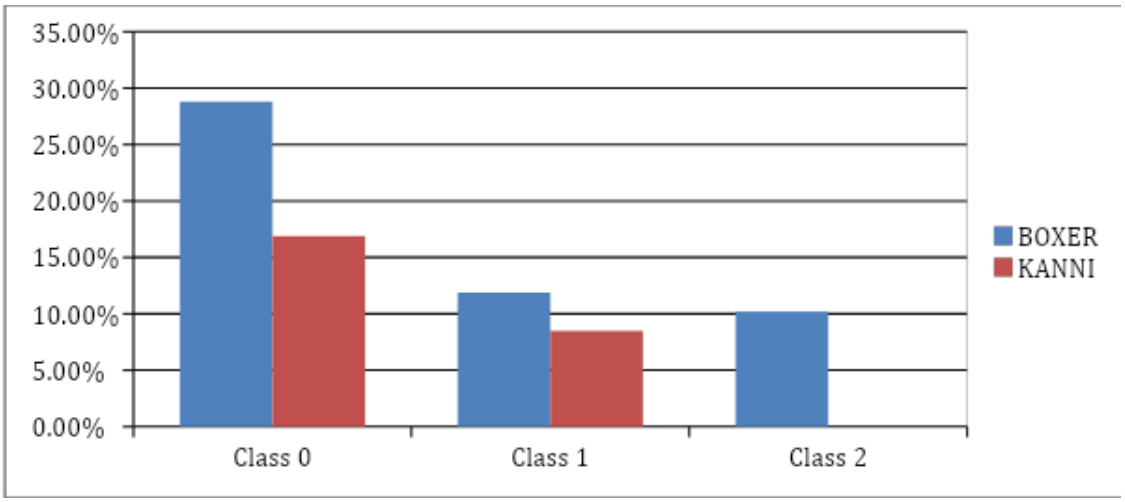
Graph 5 shows the dentition status distribution among the working breed of dogs. The majority of percentage distribution (78%) was seen among the boxer breed, and the least percentage distribution (44.4%) was seen among the Kanni breed of a working breed.

TABLE 8: DISTRIBUTION OF CALCULUS STAUS AMONG THE WORKING BREED OF DOGS

S.No	Calculus classification	Boxer breed	Kanni breed	P-value
1.	Class 0	28.8%	16.9%	0.092
2.	Class 1	11.9%	8.5%	
3.	Class 2	10.2%	0%	
4.	Class 3	0%	0%	
5.	Class 4	0%	0%	
6.	Class 5	0%	0%	

Table 8 shows the percentage distribution among the calculus status among the working breed of dog. Among the distribution, the majority were under the boxer breed of class 0, which was 28.8%, and least were seen among the Kanni breed, which was 10.2%.

GRAPH 6: CALCULUS STATUS BETWEEN THE WORKING BREED OF DOGS



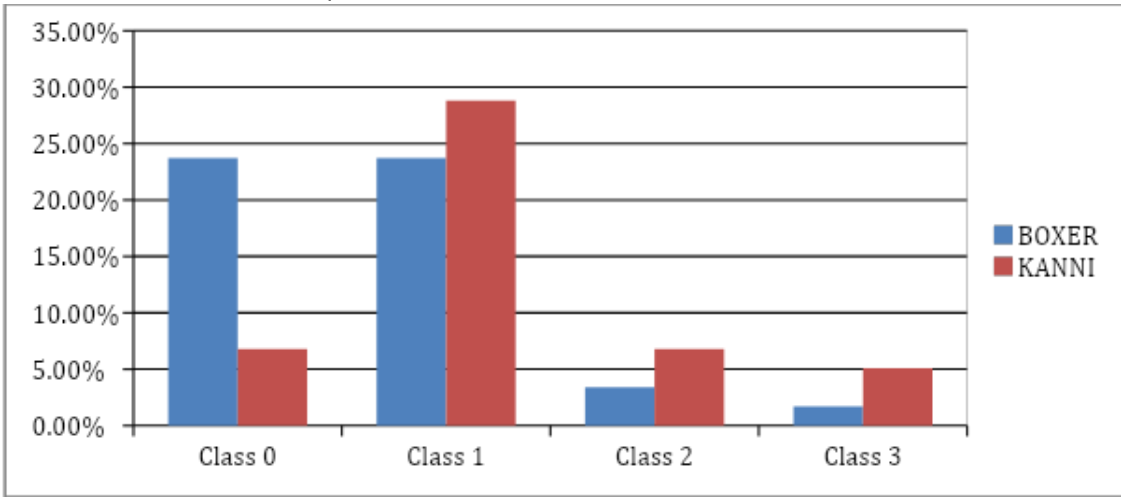
Graph 6 shows the calculus status between the working breed of dogs. The majority of the distribution was found in the boxer breed of class 0, which was 28.8%, and least was seen among the Kanni breed of class 2, which was 0%.

TABLE 9: DISTRIBUTION OF PLAQUE STATUS AMONG THE WORKING BREED OF DOGS

S.No	Plaque classification	Boxer breed	Kanni breed	P-value
1.	Class 0	23.7%	6.8%	0.074
2.	Class 1	23.7%	28.8%	
3.	Class 2	3.4%	6.8%	
4.	Class 3	1.7%	5.1%	
5.	Class 4	0%	0%	
6.	Class 5	0%	0%	

Table 9 shows the percentage distribution among the plaque status among the working breed of dog. Among the distribution, the majority were under the Kanni breed of class 1, which was 28.8%, and least were seen among the boxer breed of class 3, which was 1.7%.

GRAPH 7: PLAQUE STATUS BETWEEN THE WORKING BREED OF DOGS



Graph 7 shows the plaque status between the working breed of dogs. The majority of the distribution was found in the Kanni breed of class 1, which was 28.8%, and least was seen among the boxer breed of class 3, which was 1.7%.

DISCUSSION:

It is an era that was not only human beings but also animals are being affected by deadly diseases and sickness. Hence it is important for us, the owners, to keep our pets, the companions healthy and hygienic. We must take precautions in various ways to maintain their hygiene and health. Though general health is important, their oral health plays a significant role in maintaining hygiene. Among the animal species, dogs and cats are easily prone to dental health problems like Dental caries, plaque, and periodontitis, which are most commonly caused by Gram-negative anaerobic bacteria. At least a decent oral hygiene is maintained to maintain a healthy oral cavity[7].

The first study was based on the beneficial effect of brushing in a dog's oral cavity. This study was conducted to determine which was effective for the dogs, brushing once daily or three times a day. It was shown within 48 working dog breeds. It was found that brushing once a day, 3 times a week, was a very suitable, sufficient, and laid-back way to maintain dogs' oral hygiene status[8].

In the present study, they were positive association between the boxer and kanni breed of working breed in respect to malocclusion, gingivitis and stains. While assessing the malocclusion status by using American Kennel Club classification and found that majority of working breed had a normal occlusal status. While recording the visual periodontal disease assessment tool for assessing the periodontal status, majority of the working breed (38.3%) had a good periodontal status. While assessing the calculus and plaque status, majority of the working breed had a small fleck of calculus around the tooth surface[9].

This study concluded that brushing three times a week was enough to maintain gingival health. At the same time, daily brushing resulted in traumatic gingival inflammation and Brushing twice daily with a stiff bristle human toothbrush resulted in the gingival lesion in dogs. Another study[10] on the influence of diet on cats and dogs' oral health was done in 2006. According to this, the oral cavity in dogs is commonly affected by pathology, with periodontal disease most frequently recognized. Although changes in feeding methods have arguably improved dogs' health by reducing or preventing diseases associated with nutritional deficiencies and excesses, the periodontal disease remains a serious problem. Numerous studies showed an influence of diet and home oral hygiene on periodontal health. There is reasonable evidence that soft diets are associated with increased frequency and severity of periodontal disease and that harder foods requiring vigorous mastication are preferable for dogs[11]. The limitation of the study is only a small number of samples was included in this study. Further longitudinal studies should be conducted to get more appropriate results. There might also be a chance of gender and age bias.

CONCLUSION

It is now evident that we must not turn a blind eye to the difficulties the human's best friend faces as the infections have an increased probability of spreading to other organs and causing systemic effects. It is high time to raise awareness about oral hygiene importance in dogs to their respective owners so that certain oral diseases can be prevented or treated accordingly. As humans have a daily oral regimen to maintain their oral health, the same kind of thing should be implemented for dogs also. There are specific toot brushes for dogs available already; it is just our duty to spread awareness to dog owners. Even dogs chew sticks are available, which serves to remove the superficial part of calculus to some extent. The healthier the oral cavity is maintained, the lower the risk for them to experience various dental problems as discussed above.

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