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Disease Prevalence in Pets at Various Pet Hospitals in Bangladesh

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Abstract **Original Research Article**

A cross-sectional study was conducted to estimate the hospital-based prevalence of different clinical diseases and conditions in dogs and cats attending the selected hospitals. A total of 837 cases (dogs, 24.61%, and cats, 75.39%) of different clinical diseases and conditions were studied during the study. These cases were primarily categorized as infectious, non-infectious, and non-specific diseases, and the prevalence of clinical conditions was analyzed on the basis of age, sex, and breed. It was reflected that the highest prevalence was recorded in dog infectious diseases (44.18%) and non-specific diseases (33.43%) in cats, but non-infectious cases were the lowest in both dogs and cats 10.68%) and 21.56%, respectively. Among them, disease-specific prevalence was seen noticeably in dogs: maggot infestation (15.05%), dermatitis (12.14%), CPV (6.8%), pyometra (4.85%) etc. On the contrary, in cats, significant cases were diagnosed as flu (6.66%), endo-parasitic infection (5.23%), conjunctivitis and anorexia (4.44%), FPV (4.12%), etc., respectively. The prevalence of fracture in dogs and FPV in cats was higher at a young age (≤12 months) with a significant p-value ($P<0.05$). Although the prevalence of post-surgical complications and mite infestation were higher in older cats (more than 24 months) compare to young and old cats. Among the different diseases of dogs and cats, pyometra and post-surgical complications were found to be significant ($P<0.05$) in relation to sex. The prevalence of HRS in Persian cats and flea infestation in Pomeranian dogs was significantly ($P<0.05$) higher in relation to breed. These results offer valuable insights into many canine and feline diseases and might be the foundation for discussing vaccination policies for dogs and cats and doing more in-depth studies to create proactive and tactical plans for managing those diseases in Bangladesh.

Keywords: Prevalence, Diseases, Vaccination, Insights, Pet Animals.

INTRODUCTION

Pets are tamed, cozy, and well-mannered animals kept for their owners' company and enjoyment. A pet's well-known qualities include their attractiveness, intelligence, loyalty, and playful nature [1]. The tradition of keeping animals as pets is flourishing throughout the world, including Bangladesh, as modern society becomes more urbanized day by day. Although dogs and cats are the most conventional types of pets, people also own rabbits, guinea pigs, rodents, hamsters, fancy rats, and avian pets like parakeets and parrots; aquatic pets like frogs and tropical fish; and arthropod pets like tarantulas and crabs [2]. Numerous benefits come from owning pets, including companionship, psychological support, and even improved health. Pets have even begun to take the place of childrearing and child care in many nations [3]. The health and wellbeing of pet owners are greatly enhanced by pet animals. Better self-esteem, less loneliness, more exercise, and a sense of security are all linked to their ownership [4]. Pet animals are valuable household companions that support both the owners' well-being and the physical, social, and emotional growth of their children [5]. In addition, it has been observed that pet owners have lower blood pressure and cholesterol than non-pet owners, visit their doctor less frequently, and use fewer medications [6]. In contemporary human civilization, the place of pets has evolved. Pets are now considered to be an essential part of modern life due to their excellent health effects. In fact, several specialized therapeutic activities known as "pet therapy" involve the use of pets [7]. Pet animals have been viewed as "family members" in families since the middle of the 20th century, not to mention that occasionally they have taken the place of children [8]. After losing a loved one, getting a pet is often recommended. In unexpected ways that were formerly

considered unthinkable, man's "best friend" has undoubtedly demonstrated his love and commitment to the human species [9]. Even with meticulous upbringing, pet owners still experience a variety of illnesses or ailments in their animals due to both infectious (bacterial, viral, fungal, parasitic, etc.) and non-infectious (accidental injury, diabetes, nutritional deficiency, etc.) etiologies.

Pet animals are frequently encountered by bacterial diseases such as cat scratch diseases, salmonellosis, leptospirosis, brucellosis, and viral infections such as rabies, feline panleukopenia, canine distemper, infectious canine hepatitis, canine parvovirus enteritis, and kennel cough [10]. Fungal diseases such as ringworm, cryptococcosis, and blastomycosis; internal parasitic diseases like hookworms, toxocariasis, and toxoplasmosis; and external parasitic infestations caused by fleas, ticks, and mites are also very common infections in dogs and cats. These animals commonly have a variety of wounds, including open, punctured, and penetrating wounds [10]. Furthermore, operations including castration, cystotomy, ovariectomy, orthopedic surgery, wound care, myiasis, abscess, tumor and nail trimming, etc. are also noticed [11].

Pet ownership is associated with some known health risks, despite the fact that animals provide enormous advantages to our society [5]. The most prevalent health risks are animal bites and allergies to pets, but domestic pets can also expose people to a wide range of infections, including bacterial, fungal, parasitic, and viral illnesses [12]. WHO defines zoonoses as “those diseases and infections which are naturally transmitted between vertebrate animals and humans." As pets share the same environment as humans, they can play a role as reservoirs for zoonotic diseases. Research has also shown that domestic animals directly contribute to the spread of zoonosis [3]. Approximately 61% of all human infections, or roughly 1415 pathogens in total, are zoonotic. About 75% of newly discovered infectious illnesses in humans are brought on by zoonotic pathogens, and almost half of all infectious diseases in humans are now considered emergent [13]. A number of zoonotic diseases are commonly attributed to pets and companion animals, such as rabies, toxoplasmosis, brucellosis, campylobacteriosis, ehrlichiosis, giardiasis, hookworms, influenza, leptospirosis, roundworms, salmonellosis, staphylococcosis (MRSA), and tularemia. A vast array of companion animals and pets can harbor various zoonoses, including rabies, salmonellosis, and staphylococcosis [14]. Humans can become infected by direct contact with pets (skin, nasopharyngeal or respiratory secretions, urine, or feces) or indirect contact (food or drink tainted by the pet's infectious secretions) [12]. In order to maintain a healthy environment and society for both companion animals and their owners, prevention and control of animal illnesses are crucial. After making an accurate assessment of the causes and spread of illnesses, the most important factor in this respect is positive information combined with improved hygienic practices [10]. The report may be conducive for veterinary practitioners as well as pet owners to know about the current status of pet animal diseases, different factors (age, sex, breed) influencing disease occurrences in pets, and the risk for human health due to potential pet zoonoses. It may also help to take important preventive measures for controlling diseases in both pets and pet owners. This study aimed to determine the prevalence of different diseases of pet animals and to identify the risk factors associated with the occurrences of diseases.

MATERIALS AND METHODS

A cross-sectional study was conducted using a previously formed questionnaire as well as clinical case records, focusing on the information about the pet animals. Socio-demographic variables such as age, sex, breed, and body weight were collected by interviewing pet owners.

Study Area

The study was directed at different pet hospitals (Sylhet Pet Care & Teaching and Training Pet Hospital and Research Center) and the Central Veterinary Hospital of Bangladesh.

Study Period: The study was conducted from June 2023 to January 2024 in Sylhet and Dhaka.

Study Population

A total of 837 pet animals (dogs, 631 and cats, 206) were examined, and 695 animals were categorized and sub-categorized under different groups of diseases and disorders such as infectious (bacterial, viral, parasitic, fungal, etc.), non-infectious (dystocia, fracture, HRS), and non-specific (anorexia, alopecia, nervous disorder, jaundice, etc.). The diagnosis of diseased animals was performed based on the owner’s complaints, clinical examination, physical examination, and rapid diagnostic test.

Diagnosis of Disease

A tentative diagnosis of disease was performed at CVH (Central Veterinary Hospital) and SPC (Sylhet Pet Care) by considering the owner’s complaint, clinical examination, and physical examination. At the Teaching and Training Pet Hospital and Research Center (TTPHRC), a confirmatory diagnosis was performed by considering the owner’s complaints, clinical and physical examination, rapid kit tests (Flu, Feline Infectious Peritonitis, Feline Leukemia Virus), X-rays, ultrasonography, and biochemical tests. A rapid kit test for confirmatory diagnosis of some diseases was also performed at SPC. Owner Complaints: During the assessment of the animals, the owner's objections were taken into consideration. Clinical Examination of Animals: First, a thorough examination of the patient's overall disposition—alertness, dullness, or depression—was conducted from a distance. Also, based on the

conditions of pet animals, posture and gait (whether normal or abnormal) were assessed. A visual examination was conducted to make a close assessment of the animals after the distant inspection. For finding anomalies, three methods were used: parting the hair, mild palpation, and close direct observation. The location and distribution of lesions, as well as their character, were also investigated. Physical Examination: Temperature and pulse rate were measured for the diagnosis of diseases or disease conditions. For surgical interference, anesthesia was performed.

Data Management and Statistical Analysis

The collected data were entered in the Microsoft Excel (2007) spread sheet and subsequently organized and processed for further analysis of prevalence and p-value (chi square test). Diseases were classified as infectious, with viruses, bacteria, fungi, and parasites; non-specific (mixed infectious agents as the causative agents); and non-infectious. Based on the various stages of puberty, the age of the dog was divided into three categories: young (≤6 months), adult (7-36 months), and old (>36 months), and for the cat, the age was divided into three categories: young (≤6 months), adult (7-24 months), and old (>24 months), as suggested by Hasan *et al*., with a slight deviation. Breeds were classified into local and other exotic breeds as per the study of Sarker *et al*., [10-16].

The data were then expressed as prevalence, which was calculated by following formula:

$$\text{Prevalence} = \frac{\text{Number of current cases(new and preexisting)at a specified point in time}}{\text{Population at the same specified point in time}} X100$$

RESULTS

A total of 837 pet animals (dogs 206 and cats 631) were observed; among them, dogs and cats were 24.61 % and 75.39 %, respectively. In dogs, the highest prevalence (15.05%) was found in maggot infestation, while in cats, flu (6.66%) was the most prominent disease. On the other hand, the lowest prevalence (1.46%) in dogs was dystocia, and in cats, the lowest prevalence (0.48%) was lice infestation (Figure 1).

Age-wise Prevalence of Diseases of Dogs and Cats

The overall highest prevalence of dogs was observed in >12–36 months (34.47%), and lowest in up to 12 months (20.87%) (Table 1). The overall highest prevalence of cat diseases was in the age group up to 1 year (46.43%), and the lowest prevalence was in the age group above 24 months (13.31%) (Table 2). The highest prevalence of bacterial, viral, parasitic, and non-specific diseases was observed in dog between 12 and 36 months of age (bacterial, viral, 4.85% and parasitic, non-specific, 11.17%). On the other hand, the lowest prevalence of viral and non-infectious diseases was recorded in the above 36 months (1.46% and 0.97%, respectively), but the lowest prevalence of bacterial, parasitic, and non-specific diseases was seen up to 12 months of age (2.91%, 5,34%, and 3.88%, respectively). In dog prevalence of fracture was higher (1.94%) in young (≤12 months) with significant variation (P<0.05) according to age. Among cats, the highest prevalence of viral, parasitic, non-infectious, and non-specific diseases was found up to 12 months of age (8.87%, 4.75%, 12.04%, and 18.07%, respectively), followed by the lowest prevalence of viral, parasitic, fungal, non-infectious, and non-specific diseases observed above 24 months of age (3.01%, 0.48%, 0.48%, 2.85%, and 5.55%, respectively).

Sex-wise Prevalence of Diseases in Dogs and Cats

The prevalence of clinical cases in dogs and cats in relation to their sex reflected that the highest numbers of male pets were visited by the hospital. Based on sex, among the 159 clinical cases of dogs, 93 (45.15%) (table3) were observed in male dogs, and 317 (50.24%) were male (table 4) cats affected among the 536 recorded cases. In male dogs, the highest prevalence (15.05%) was seen with parasitic infection among them (10.19%) affected by maggot infestation, while the lowest (3.4%) was affected by bacterial infection (abscess: 2.43% and pyoderma: 0.97%)(table3)On the other hand, in the case of female dogs, the highest prevalence (9.71%) was observed with non-specific diseases, followed by (9.22%) and (7.28%) parasitic and bacterial diseases, respectively, while the lowest prevalence (1.46%) was affected by viral disease (Table 4). Pyometra showed significant variation (P<0.05) in female dogs.

In the case of cats, the highest prevalence was 19.02% and 14.42% affected by non-specific diseases by male and female cats, respectively, while the lowest prevalence was 0.95% and 0.43%, respectively (table 4). The highest prevalence of male and female cats encountered by the flu (male: 3.80%, female: 2.85%). Fungal diseases showed significant difference (P<0.05) in male cats compare to female cat.

Breed-Wise Prevalence of Diseases in Dogs and Cats

The results revealed that the overall highest prevalence (35.82%) was seen in the Persian breed, followed by local (33.43%), and others (8.4%) (Table 5). Overall, the lowest prevalence (3.49%) was observed in the domestic short-hair breed. The highest prevalence of bacterial, viral, and non-specific diseases was observed in the Persian breed (2.22%, 6.18%, and 14.58%, respectively) and parasitic, fungal, and non-infectious disease prevalence was highest in the local breed (4.12%, 1.90%, and 8.72%, respectively). Prevalence of HRS was higher (0.48%) in Persian cats compare to other cats and showed significant variation (P<0.05). Results of breed-wise prevalence of dogs (Table 6) revealed that the overall highest prevalence (26.7%) was seen in the German Shepherd dog, followed by the local breed (26.21%), Labrador (5.34%), Golden Retriever (4.85%), and the lowest prevalence (0.97%) was seen in the bulldog and Samoyed breed. In GSD, non-specific disease was the highest (10.67%) and non-infectious disease was the lowest (2.43%). Among non-specific

diseases, the prevalence of dermatitis was the highest (6.31%). Specifically, the highest prevalence of viral, parasitic, and non-infectious diseases was seen in the local breed (4.85%, 7.77%, and 5.34%, respectively), followed by in GSD (4.37%, 5.34%, and 2.43%, respectively), and Golden Retriever (0%, 1.43%, and 0.97%, respectively). The highest prevalence (3.88%) of bacterial diseases was seen in both GSD and local breeds. Mite infestation was higher (1.46%) in local breed compare to other dog breeds and showed significant difference (P<0.05).

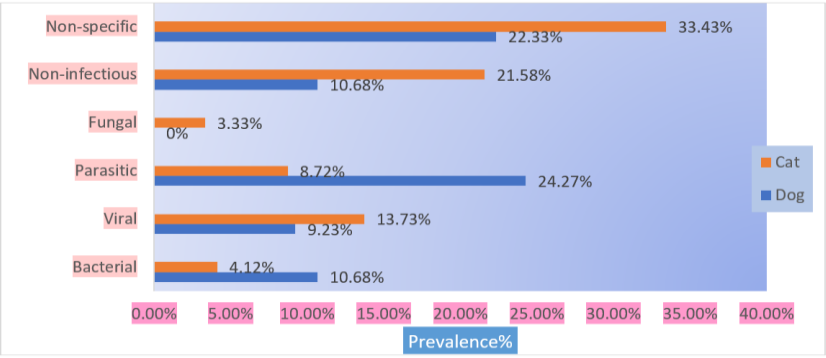

Figure 1: Overall prevalence of dog and cat diseases

Table 1: Association of age with the prevalence of dog diseases

Diseases and conditions	Types of diseases	≤12 months	>12-36 months	>36 months	Total	P-value
Infectious-disease						
Bacterial	Abscess	3(1.46%)	3(1.46%)	1(0.49%)	7(3.4%)	0.56
	Pyoderma	2(0.97%)	3(1.46%)		5(2.43%)	0.75
	Pyometra	1(0.49%)	4(1.94%)	5(2.43%)	10(4.85%)	0.24
	Total bacterial	6(2.91%)	10(4.85%)	6(2.91%)	22(10.7%)	
Viral	CPV	6(2.91%)	7(3.39%)	1(0.49%)	14(6.8%)	0.16
	CD	0(0%)	3(1.46%)	2(0.97%)	5(2.43%)	0.77
	Total viral	6(2.91%)	10(4.85%)	3(1.46%)	19(9.23%)	
Parasitic	Endo-parasitic	5(2.43%)	2(0.97%)	0(0%)	7(3.4%)	0.06
	Flea infestation	1(0.49%)	4(1.94%)	1(0.49%)	6(2.91%)	0.55
	Mite infestation	1(0.49%)	4(1.94%)	1(0.49%)	6(2.91%)	0.55
	Maggot	4(1.94%)	13(6.31) %	14(6.796%)	31(15.1%)	0.06
	Total parasitic	11(5.33%)	23(11.17%)	16(7.77%)	50(24.3%)	
Sub-total		23(11.17%)	43(20.87%)	25(12.14)	91(44.2%)	
Non-Infectious	Dystocia	0(0%)	0(0%)	3(1.46%)	3(1.46%)	0.06
	Fracture	4(1.94%)	0(0%)	0(0%)	4(1.94%)	0.01*
	Accidental injury	6(2.91%)	4(1.94%)	1(0.49%)	11(5.33%)	0.09
	Dog bite	2(0.97%)	1(0.49%)	1(0.49%)	4(1.94%)	0.56
Sub-total		12(5.83%)	5(2.43%)	5(2.43%)	22(10.7%)	
Non-Specific	Allergy	0(0%)	3(1.46%)	3(1.46%)	6(2.91%)	0.59
	Alopecia	1(0.49%)	3(1.46%)		4(1.94%)	0.61
	Anorexia	1(0.49%)	4(1.94%)	2(0.97%)	7(3.39%)	0.71
	Dermatitis	4(1.94%)	11(5.34) %	10(4.85%)	25(12.1%)	0.31
	Nervous-disorder	2(0.97%)	2(0.97%)		4(1.94%)	0.66
Sub-total		8(3.88%)	23(11.17%)	23(15.78%)	46(22.3%)	
Grand total		43(20.8%)	71(34.5%)	45(21.8%)	159(77.18%)	

*Significant: P ≤ 0.05

Table 2: Association of age with the prevalence of cat diseases

Diseases and conditions	types of disease	≤12 months	>12-24months	>24 months	Total	P-value
Infectious disease						
Bacterial	Abscess	7(1.11%)	1(0.16%)	2(0.32%)	10(1.58%)	0.39
	Pyometra	3(0.48%)	4(0.63%)	9(1.43%)	16(2.54%)	0.28
	total bacterial	10(1.58%)	5(0.79%)	11(1.74%)	26(4.12%)	
Viral	FPV	23(3.65%)	2(0.32%)	1(0.16%)	26(4.12%)	.002*
	Flu	24(3.80%)	15(2.38%)	3(0.48%)	42(6.66%)	0.28
	FIP	9(1.43%)	6(0.95%)	4(0.63%)	19(3.01%)	0.75
	total viral	56(8.87%)	23(3.65%)	8(1.27%)	87(13.78%)	
Parasitic	Endo-parasitic	23(3.65%)	8(1.27%)	2(0.32%)	33(5.23%)	0.16

	Flea infestation	5(0.79%)	7(1.11) %	2(0.32%)	14(2.22%)	0.23
	Lice infestation	1(0.16%)	1(0.16%)	1(0.16%)	3(0.48%)	0.65
	Mite problem	1(0.16%)	0(0%)	4(0.63%)	5(0.79%)	0.007*
	total parasitic	30(4.75%)	16(2.54%)	9(1.43%)	55(8.72%)	
Fungal		7(1.11%)	11(1.74%)	3(0.48%)	21(3.33%)	0.06
Sub-total		103(16.3%)	55(8.72%)	31(4.91%)	189(29.95%)	
Non-infectious	Cat bite	8(1.27%)	5(0.79%)	0(0%)	13(2.06%)	0.79
	Fracture	16(2.54%)	3(0.48%)	2(0.32%)	21(3.33%)	0.13
	Accidental	18(2.85%)	9(1.43%)	1(0.16%)	28(4.44%)	0.20
	Dystocia	0(0%)	4(0.63%)	9(1.43%)	13(2.06%)	0.79
	Castration	3(0.48%)	10(1.58%)	3(0.48%)	16(2.54%)	0.007*
	HRS	6(0.95%)	2(0.32%)	0(0%)	8(1.27%)	0.71
	Paracetamol-poisoning	3(0.48%)	2(0.32%)	2(0.32%)	7(1.11) %	0.62
	Nutritional-deficiency	13(2.06%)	6(0.95%)	1(0.16%)	20(3.17%)	0.39
	Dog bite	9(1.43%)	1(0.16%)		10(1.58%)	0.16
Sub-total		76(12.04%)	42(6.66%)	18(2.85%)	136(21.55%)	
Non-Specific	Allergy	3(0.48%)	1(0.16%)	1(0.16%)	5(0.79%)	0.88
	Alopecia	8(1.27%)	3(0.48%)	4(0.63%)	15(2.38%)	0.44
	Anorexia	16(2.54%)	6(0.95%)	6(0.95%)	28(4.44%)	0.53
	Conjunctivitis	16(2.54%)	9(1.43%)	3(0.48%)	28(4.44%)	0.76
	Constipation	5(0.79%)	1(0.16%)	5(0.79%)	11(1.74%)	0.01
	Diarrhoea	15(2.38%)	4(0.63%)		19(3.01%)	0.28
	Dermatitis	4(0.63%)	2(0.32%)	3(0.48%)	9(1.43%)	0.34
	Food poisoning	6(0.95%)	8(1.27%)	1(0.16%)	15(2.38%)	0.122
	Gastritis	1(0.16%)	12(1.90%)	1(0.16%)	14(2.22%)	2.42
	Jaundice	3(0.48%)	2(0.32%)	1(0.16%)	6(0.95%)	0.97
	Pneumonia	17(2.69%)	2(0.32%)	4(0.63%)	23(3.65%)	0.08
	Post-surgical complications	0(0%)	2(0.32%)	4(0.63%)	6(0.95%)	0.006*
	Vomiting	6(0.95%)	6(0.95%)	1(0.16%)	13(2.06%)	0.38
	Nervous disorder	14(2.22%)	4(0.63%)	1(0.16%)	19(3.01%)	0.21
Subtotal		114(18.07%)	62(9.83%)	35(5.55%)	211(33.44%)	
Grand total		293(46.43%)	159(25.2%)	84(13.31%)	536(84.94%)	

*Significant: P ≤ 0.05

Table 3: Relationship of sex with the prevalence of dog diseases

Diseases & conditions	types of disease	Male	Female	Total	P-value
Infectious disease					
Bacterial	Abscess	5(2.43%)	2(0.97%)	7(3.4%)	0.48
	Pyoderma	2(0.97%)	3(1.46%)	5(2.43%)	0.40
	Pyometra	0(0%)	10(4.85%)	10(4.85%)	0.004*
	total bacterial	7(3.4%)	15(7.28%)	22(10.68%)	
Viral	CPV	11(5.34%)	3(1.46%)	14(6.8%)	0.12
	CD	5(2.43%)		5(2.43%)	0.22
	total viral	16(7.77%)	3(1.46%)	19(9.23%)%	
Parasitic infection	Endo-parasitic	4(1.94) %	3(1.46%)	7(3.4%)	0.94
	Flea problem	2(0.97%)	4(1.94) %	6(2.91%)	0.21
	Mite infestation	4(1.94) %	2(0.97%)	6(2.91%)	0.08
	Maggot problem	21(10.19%)	10(4.85%)	31(15.05%)	0.27
	total parasitic	31(15.05%)	19(9.22%)	50(24.27%)	
Sub-total		54(26.21%)	37(17.96%)	91(44.18%)	
Non- Infectious	Dystocia	0(0%)	3(1.46%)	3(1.46%)	0.11
	Fracture	2(0.97%)	2(0.97%)	4(1.94%)	0.73
	Accidental injury	8(3.88 %)	3(1.46%)	11(5.34%)	0.33
	Dog bite	3(1.46%)	1(0.49%)	4(1.94%)	0.50
Sub-total		13(6.31%)	9(4.37 %)	22(10.68%)	
Non-Specific	Allergy	2(0.97%)	4(1.94%)	6(2.91%)	0.21
	Alopecia	2(0.97%)	2(0.97%)	4(1.94%)	0.73
	Anorexia	4(1.94%)	3(1.46%)	7(3.4%)	0.94
	Dermatitis	16(7.77) %	9(4.37) %	25(12.14%)	0.57
	Nervous-disorder	2(0.97%)	2(0.97%)	4(1.94) %	0.73
Sub-total		26(12.62%)	20(9.71) %	46(22.33) %	
Grand total		93(45.15%)	66(32.03%)	159(77.18%)	

*Significant: P ≤ 0.05

Table 4: Association of sex with the prevalence of cat diseases

Diseases & conditions	type of disease	Male	Female	Total	P-value
Infectious disease					
Bacterial	Abscess	6(0.95%)	4(0.63%)	10(1.58%)	0.95
	Pyometra	0(0%)	16(2.54%)	16(2.54%)	0.0002*
	total bacterial	6(0.95%)	20(3.17%)	26(4.12%)	
Viral	FPV	15(2.38%)	11(1.74%)	26(4.12%)	0.88
	Flu	24(3.80%)	18(2.85%)	42(6.66%)	0.79
	FIP	10(1.58%)	9(1.43%)	19(3.01%)	0.56
	total viral	49(7.77%)	38(6.02%)	87(13.79%)	
Parasitic	Endo-Parasitic infection	15(2.38%)	18(2.85%)	33(5.23%)	0.10
	Flea infestation	7(1.11%)	7(1.11%)	14(2.22%)	0.48
	Lice infestation	1(0.16%)	2(0.32%)	3(0.48%)	0.36
	Mite infestation	5(0.79%)	0(0%)	5(0.79%)	0.23
	total parasitic	28(4.44%)	27(4.28%)	55(8.72%)	
Fungal disease		17(2.69%)	4(0.63%)	21(3.33%)	0.04*
Subtotal					
Non- Infectious	Cat bite	9(1.43%)	4(0.63%)	13(2.06%)	0.45
	Fracture	19(3.01%)	2(0.32%)	21(3.33%)	0.003*
	Accidental injury	21(3.33%)	7(1.11%)	28(4.44%)	0.08
	Dystocia	0(0%)	13(2.06%)	13(2.06%)	0.0008*
	Castration	16(2.54%)	0(0%)	16(2.54%)	0.03*
	HRS	3(0.48%)	5(0.79%)	8(1.27%)	0.21
	Paracetamol poisoning	6(0.95%)	1(0.16%)	7(1.11%)	0.15
	Nutritional-deficiency disorder	14(2.22%)	6(0.95%)	20(3.17%)	0.32
	Dog bite	0(0%)	3(0.48%)	10(1.58%)	0.59
Subtotal		88(13.95%)	41(6.5%)	136(21.56%)	
Non-Specific	Allergy	1(0.16%)	4(0.63%)	5(0.79%)	0.07
	Alopecia	8(1.27%)	7(1.11%)	15(2.38%)	0.64
	Anorexia	18(2.85%)	10(1.58%)	28(4.44%)	0.57
	Conjunctivitis	18(2.85%)	10(1.58%)	28(4.44%)	0.57
	Constipation	9(1.43%)	2(0.32%)	11(1.74%)	0.12
	Diarrhoea	10(1.58%)	9(1.43%)	19(3.01%)	0.56
	Dermatitis	7(1.11%)	2(0.32%)	9(1.43%)	0.25
	Food poisoning	10(1.58%)	5(0.79%)	15(2.38%)	0.55
	Gastritis	5(0.79%)	9(1.43%)	(14)2.22%	0.07
	Jaundice	4(0.63%)	2(0.32%)	6(0.95%)	0.7
	Pneumonia	14(2.22%)	9(1.43%)	23(3.65%)	0.86
	Post-surgical complications	0(0%)	6(0.95%)	6(0.95%)	0.02
	Vomiting	5(0.79%)	8(1.27%)	13(2.06%)	0.12
	Nervous-disorder	11(1.74%)	8(1.27%)	19(3.01%)	0.91
Subtotal		120(19.02%)	91(14.42%)	211(33.43%)	
Grand total		317(50.24%)	219(34.71%)	536(84.94%)	

*Significant: $P \leq 0.05$

Table 5: Association of breed with the prevalence of cat diseases

Diseases& conditions	types of disease	Domestic long hair	Domestic short hair	Local	Persian	Others	Total	P value
Infectious disease								
Bacterial	Abscess	0(0%)	1(0.16%)	2(0.32%)	4(0.63%)	3(0.48%)	10(1.58%)	0.2
	Pyometra	1(0.16%)	1(0.16%)	5(0.79%)	8(1.27%)	1(0.16%)	16(2.54%)	0.9
	total bacterial	1(0.16%)	2(0.32%)	7(1.11%)	12(1.90%)	4(0.63%)	26(4.12%)	
Viral	FPV	1(0.16%)	0(0%)	8(1.27%)	14(2.22%)	3(0.48%)	26(4.12%)	0.83
	Flu	3(0.48%)	1(0.16%)	19(3.01%)	17(2.69%)	2(0.32%)	42(6.66%)	0.64
	FIP	0(0%)	3(0.48%)	5(0.79%)	8(1.27%)	(3)0.48 %	19(3.01%)	0.09
	total viral	4(0.63%)	4(0.63%)	32(5.07%)	39(6.18%)	8(1.27%)	87(13.78%)	
Parasitic	Parasitic infection	0(0%)	1(0.16%)	19(3.01%)	11(1.74%)	2(0.32%)	33(5.23%)	0.4
	Flea infestation	0(0%)	0(0%)	2(0.32%)	9(1.43%)	3(0.48%)	14(2.22%)	0.21
	Lice infestation	0(0%)	0(0%)	2(0.32%)	0(0%)	1(0.16%)	3(0.48%)	0.69
	Mite infestation	0(0%)	0(0%)	3(0.48%)	2(0.32%)	0(0%)	5(0.79%)	0.96
	total parasitic	0(0%)	1(0.16%)	26(4.12%)	22(3.49%)	6(0.95%)	55(8.72%)	
Fungal infection		0(0%)	1(0.16%)	12(1.90%)	7(1.11%)	1(0.16%)	21(3.33%)	0.61
subtotal		5(0.79%)	8(1.27%)	77(12.20%)	80(12.68%)	19(3.01%)	189(29.95%)	
Non- Infectious	Cat bite	1(0.16%)	0(0%)	8(1.27%)	4(0.63%)	0(0%)	13(2.06%)	0.67

	Fracture	1(0.16%)	0(0%)	9(1.43%)	6(0.95%)	5(0.79%)	21(3.33%)	0.27
	Accidental injury	0(0%)	2(0.32%)	15(2.38%)	10(1.58%)	1(0.16%)	28(4.44%)	0.48
	Dystocia	1(0.16%)	0(0%)	4(0.63%)	5(0.79%)	3(0.48%)	13(2.06%)	0.57
	Castration	0(0%)	2(0.32%)	2(0.32%)	8(1.27%)	4(0.63%)	16(2.54%)	0.04*
	High Rise Syndromes	0(0%)	1(0.16%)	1(0.16%)	3(0.48%)	3(0.48%)	8(1.27%)	0.05*
	Paracetamol poisoning	0(0%)	0(0%)	5(0.79%)	1(0.16%)	1(0.16%)	7(1.11%)	0.51
	Nutritional-deficiency	0(0%)	1(0.16%)	8(1.27%)	10(1.58%)	1(0.16%)	20(3.17%)	0.93
	Dog bite	0(0%)	0(0%)	3(0.48%)	7(1.11%)	0(0%)	10(1.58%)	0.72
subtotal		3(0.48%)	6(0.95%)	55(8.72%)	54(8.56%)	18(2.85%)	136(21.55%)	
Non-Specific	Allergy	0(0%)	0(0%)	2(0.32%)	3(0.48%)	0(0%)	5(0.79%)	0.98
	Alopecia	2(0.32%)	0(0%)	3(0.48%)	9(1.43%)	1(0.16%)	15(2.38%)	0.25
	Anorexia	2(0.32%)	0(0%)	6(0.95%)	14(2.22%)	6(0.95%)	28(4.44%)	0.14
	Conjunctivitis	4(0.63%)	2(0.32%)	9(1.43%)	13(2.06%)	0(0%)	28(4.44%)	0.12
	Constipation	1(0.16%)	1(0.16%)	5(0.79%)	2(0.32%)	2(0.32%)	11(1.74%)	0.46
	Diarrhoea	1(0.16%)	0(0%)	6(0.95%)	11(1.74%)	1(0.16%)	19(3.01%)	0.76
	Dermatitis	1(0.16%)	1(0.16%)	2(0.32%)	5(0.79%)	0(0%)	9(1.43%)	0.55
	Food poisoning	0(0%)	0(0%)	5(0.79%)	10(1.58%)	0(0%)	15(2.38%)	0.68
	Gastritis	0(0%)	0(0%)	11(1.74%)	3(0.48%)	0(0%)	14(2.22%)	0.14
	Jaundice	0(0%)	0(0%)	4(0.63%)	2(0.32%)	0(0%)	6(0.95%)	0.87
	Pneumonia	3(0.48%)	0(0%)	10(1.58%)	8(1.27%)	2(0.32%)	23(3.65%)	0.37
	Post-surgical complication	0(0%)	1(0.16%)	3(0.48%)	1(0.16%)	1(0.16%)	6(0.95%)	0.45
	Vomiting	1(0.16%)	1(0.16%)	3(0.48%)	6(0.95%)	2(0.32%)	13(2.06%)	0.73
	Nervous disorder	1(0.16%)	2(0.32%)	10(1.58%)	5(0.79%)	1(0.16%)	19(3.01%)	0.36
Subtotal		16(2.54%)	8(1.27%)	79(12.52%)	92(14.58%)	(16)2.54%	211(33.43%)	
Grand total		24(3.80%)	22(3.49%)	211(33.43%)	226(35.82%)	53(8.4%)	536(84.94%)	

*Significant: $P \leq 0.05$

Table 6: Association of breed with the prevalence of dog diseases

Diseases & conditions	types of disease	GSD	Golden Retriever	Spitz	Labrador	Rottweiler	Pomeranian	Local	Husky	Bulldog	Poodle	Samoyed	Total	P value
Infectious disease														
Bacterial	Abscess	2(0.97%)	2(0.97%)	0(0%)	0(0%)	1(0.49%)	0(0%)	2(0.97%)	0(0%)	0(0%)	0(0%)	0(0%)	7(3.4%)	0.65
	Pyoderma	1(0.49%)	1(0.49%)	0(0%)	0(0%)	1(0.49%)	0(0%)	3(1.46%)	0(0%)	0(0%)	0(0%)	0(0%)	5(2.43%)	0.79
	Pyometra	5(2.43%)	0(0%)	1(0.49%)	0(0%)	0(0%)	0(0%)	3(1.46%)	0(0%)	0(0%)	0(0%)	1(0.49%)	10(4.85%)	0.87
	total bacterial	8(3.88%)	3(1.46%)	1(0.49%)	0(0%)	2(0.97%)	0(0%)	8(3.88%)	0(0%)	0(0%)	0(0%)	1(0.49%)	22(10.68%)	
Viral	CPV	5(2.43%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	9(4.37%)	0(0%)	0(0%)	0(0%)	0(0%)	14(6.8%)	0.97
	CD	4(1.94%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.49%)	0(0%)	0(0%)	0(0%)	0(0%)	5(2.43%)	0.22
	total viral	9(4.37%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	10(4.85%)	0(0%)	0(0%)	0(0%)	0(0%)	19(9.23%)	
Parasitic	Endo-parasitic	0(0%)	0(0%)	0(0%)	1(0.49%)	0(0%)	0(0%)	4(1.94%)	2(0.97%)	0(0%)	0(0%)	0(0%)	7(3.4%)	0.22
	Flea infestation	0(0%)	1(0.49%)	0(0%)	1(0.49%)	0(0%)	2(0.97%)	2(0.97%)	0(0%)	0(0%)	0(0%)	0(0%)	6(2.91%)	0.03*
	Mite infestation	0(0%)	0(0%)	1(0.49%)	0(0%)	0(0%)	0(0%)	3(1.46%)	1(0.49%)	0(0%)	1(0.49%)	0(0%)	6(2.91%)	0.03*
	Maggot	11(5.34%)	2(0.97%)	1(0.49%)	3(1.46%)	2(0.97%)	0(0%)	7(3.4%)	2(0.97%)	1(0.49%)	0(0%)	2(0.97%)	31(15.05%)	0.84
	total parasitic	11(5.34%)	3(1.46%)	2(0.97%)	5(2.43%)	2(0.97%)	2(0.97%)	16(7.77%)	5(2.43%)	1(0.49%)	1(0.49%)	2(0.97%)	50(24.27%)	

subtotal		28(13.59 %)	6(2.92 %)	3(1.47 %)	5(2.43 %)	4(1.94 %)	2(0.97 %)	34(16.5 %)	5(2.43 %)	1(0.49 %)	1(0.49 %)	3(1.46 %)	91(44.18 %)	
Non- Infectious	Dystocia	0(0%)	1(0.49 %)	0(0%)	0(0%)	0(0%)	0(0%)	2(0.97 %)	0(0%)	0(0%)	0(0%)	0(0%)	3(1.46%)	0.92
	Fracture	0(0%)	1(0.49 %)	0(0%)	0(0%)	0(0%)	0(0%)	3(1.46 %)	0(0%)	0(0%)	0(0%)	0(0%)	4(1.94%)	0.93
	Accidental injury	5(2.43%)	0(0%)	1(0.49 %)	0(0%)	0(0%)	1(0.49 %)	4(1.94 %)	0(0%)	0(0%)	0(0%)	0(0%)	11(5.34%)	0.96
	Dog bite	0(0%)	0(0%)	0(0%)	1(0.49 %)	0(0%)	1(0.49 %)	2(0.97 %)	0(0%)	0(0%)	0(0%)	0(0%)	4(1.94%)	0.6
Subtotal	Subtotal	5(2.43%)	2(0.97 %)	1(0.49 %)	1(0.49 %)	0(0%)	2(0.97 %)	11(5.34 %)	0(0%)	0(0%)	0(0%)	0(0%)	22(10.68 %)	
Non-Specific	Allergy	4(1.94%)	0(0%)	0(0%)	(1)0.49 %	0(0%)	1(0.49 %)		0(0%)	0(0%)	0(0%)	0(0%)	6(2.91%)	0.8
	Alopecia	0(0%)	0(0%)	0(0%)	(2)0.97 %	0(0%)	0(0%)	2(0.97 %)	0(0%)	0(0%)	0(0%)	0(0%)	4(1.94%)	0.35
	Anorexia	4(1.94%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.49 %)	0(0%)	0(0%)	1(0.49 %)	1(0.49 %)	7(3.4%)	0.12
	Dermatitis	13(6.31 %)	2(0.97 %)	0(0%)	2(0.97 %)	2(0.97 %)	0(0%)	4(1.94 %)	1(0.49 %)	1(0.49 %)	0(0%)	0(0%)	25(12.14 %)	0.68
	Nervous disorder	1(0.49%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(0.97 %)	0(0%)	0(0%)	0(0%)	% 0)0	4(1.94%)	0.99
Subtot		22(10.67 %)	2(0.97 %)	0(0%)	5(2.43 %)	2(0.97 %)	1(0.49 %)	9(4.37 %)	1(0.49 %)	1(0.49 %)	1(0.49 %)	1(0.49 %)	46(22.33 %)	
Grand		55(26.7 %)	(10)4.85%	4(1.94 %)	11(5.34 %)	6(2.91 %)	5(2.43 %)	54(26.2 %)	6(2.91 %)	2(0.97 %)	2(0.97 %)	4(1.94 %)	159(77.18 %)	

*Significant: P ≤ 0.05

Prevalence of Bacterial Diseases in Dogs and Cats:

The study reveals that the prevalence of overall bacterial diseases in dogs was 10.68% (Table 1). Among bacterial diseases, the prevalence of pyometra was highest (4.85%), and pyoderma was lowest (2.43%), followed by abscess (3.4%) (figure 2). The findings revealed that 4.12% of cat diseases were caused by bacteria. Among bacterial infections, 2.54% of cats were affected by pyometra and 1.58% by abscess (Figure 3).

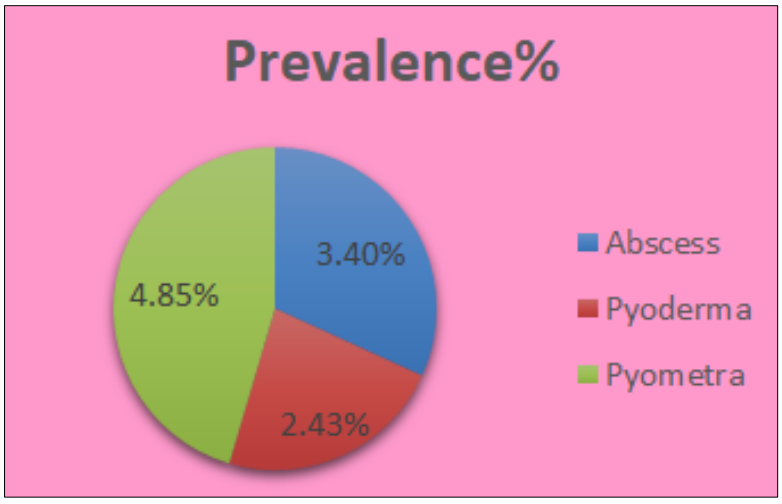

Figure 2: Bacterial diseases of dog

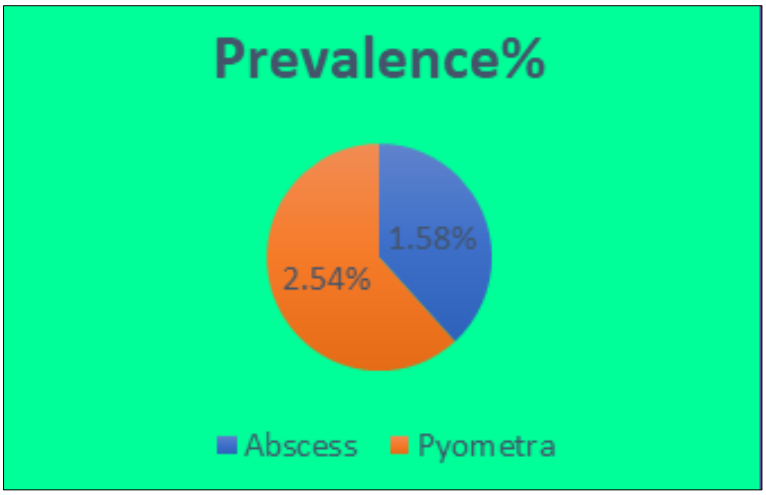

Figure 3: Bacterial diseases of cat

Prevalence of Viral Diseases in Dogs and Cats:

Results (Table 1) showed that the overall prevalence of dog diseases was 77.18%, among which viral diseases were 9.23%. The study reveals that dogs were frequently encountered by parvovirus, as 6.8% of 9.23% had a canine parvovirus infection (Figure-4). Among parvo virus-infected dogs, the highest 3.39% were in the age group 1-2 years, while the lowest 0.49% affected dogs were in the age group more than 36 months (Table1). The remaining 2.43% of cases were diagnosed as canine distemper infections in dogs. The study also revealed that the prevalence of viral diseases in cats was 13.79% (Table 2). Among the viral diseases of cats, the highest (6.66%) were affected by flu, and infection by feline infectious peritonitis was the lowest (3.01%), followed by feline parvo viral infection (4.12%) (Figure 4), (Table 2). Among the 6.66% of flu patients, the highest 3.01% were diagnosed in the local breed, followed by Persian (2.69%), domestic long hair (0.48%), others (0.32%), and domestic short hair (0.16%), respectively (Table 5). The highest 3.80% of flu patients were in the age group up to 1 year, while the lowest 0.48% of patients were in the age group more than 24 months (Table 2).

Others:

Besides bacterial and viral diseases, dogs in the study area were affected by parasitic, non-infectious, and non-specific diseases (24.27%, 10.68%, and 22.33%, respectively) (Figure 1). Among parasitic infections, maggot infection (15.05%) was the highest, followed by endo-parasitic infection (3.4%), and the prevalence of both flea and mite infestations was 2.91%. In terms of non-specific diseases, dermatitis was the highest (12.14%), alopecia and nervous disorders were the lowest (1.94%), followed by anorexia (3.4%). In cases of infectious diseases, accidental injury was the highest (5.34%), dystocia was the lowest (1.46%), followed by fracture and dog bite (1.94%) (Table 3). Although fungal infection was absent in dog while 3.33% cat were infected by fungi (Table 5).

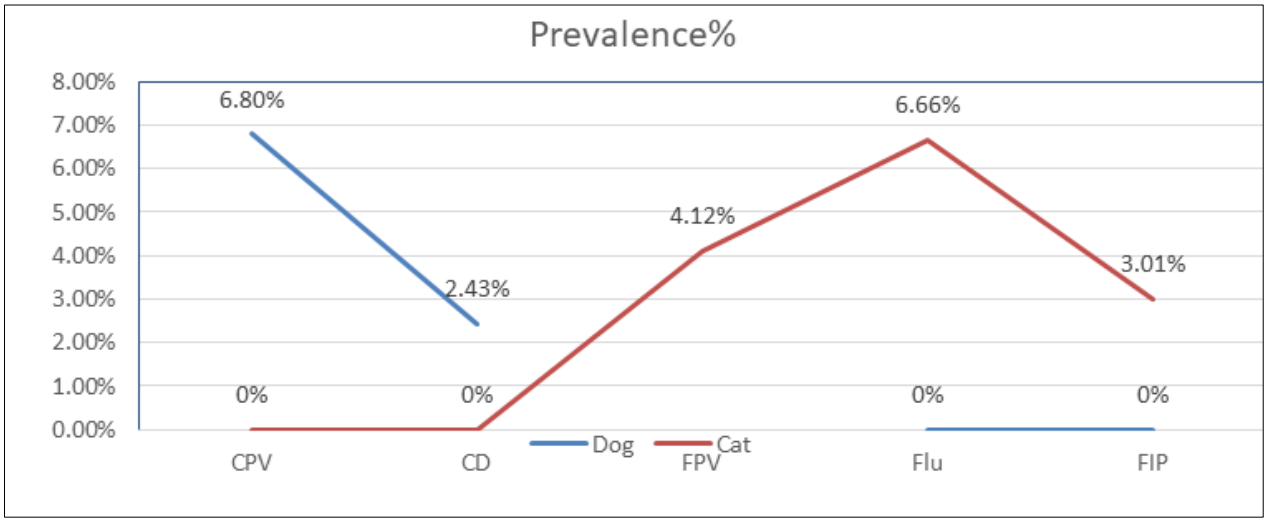

Figure 4: Viral diseases of dogs and cats

DISCUSSION

The author's hospital diagnosis throughout the research period was the foundation for this investigation into the prevalence of diseases in dogs and cats. Thus, if the author did not visit the hospitals during the period due to unavoidable circumstances, it is possible that a few cases were left out of this analysis. A documented total of 837 pet animals were observed; among them, dogs and cats were 24.61% and 75.39%, respectively. The findings were opposite to those of Parvez *et al*., as they reported that 76.42% were dogs [11]. The study showed that the prevalence of infectious diseases was highest in dogs (44.18%), which was supported by the findings of Singh *et al*., as they revealed around 65% of clinical diseases in dogs were encountered by infectious agents [15]. On the contrary, cats were infected the most (33.43%) by non-specific diseases.

In cats, the prevalence of infectious diseases was 29.95%, which was almost coherent with the findings of Yadav *et al*., as according to their findings, around 40% of cases were caused by infectious agents like bacteria, viruses, parasites, and fungal [3]. Variation in results might be due to geographical differences and a limited number of cases. The prevalence of non-infectious diseases in cats according to this study was 21.56%, which was greater than the findings of Sarker *et al.*, as they mentioned that non-infectious diseases in cats were 6%, but the findings were validated by the findings of Parvez *et al*., as they reported that the prevalence of non-infectious diseases was around 25% [11-16]. The prevalence of non-specific diseases in dogs was 22.33%, which was second highest among infectious, non-infectious, and non-specific diseases. The finding was validated by the findings of a previously published report of Islam *et al*., as they reported a prevalence of non-specific diseases of around 30% in their findings [17]. The partial difference between my findings and the findings of a previously published report is due to the differences in the duration of the study period and geographical differences.

In dogs, among infectious diseases, infections by parasites (various external and internal) were the highest, as the results revealed parasitic infection at 24.27%, and among parasitic infections, maggot infestation was the highest (15.05%), flea and mite infestation was the lowest (2.91%), followed by endo-parasitic infection at 3.4%. Sarker *et al*., reported that parasitic infection in dogs was approximately 17%, among which endo-parasitic infection was 7%, which was slightly less than the present findings [16]. Although the report by Parvez *et al*., [11], supports the endo-parasitic infection at 2.91%, according to their findings, endo-parasitic infection was around 5%, but contraindicated with external parasitic infections, as they revealed it at around 9% only [11]. Approximately 9% of parasitic infections in cats, with the highest 5.23% being various kinds of endo-parasitic infections and 2.22% being flea infestations, followed by 0.48% lice infestations and 0.79% mite infestations. Hasan *et al*., [10], reported lice infestation in cats at 0.39% [10]. According to the report by Yadav *et al*., lice infestation was 1.5%, which was almost consistent with the present findings, and flea infestation was 3.01%, which was more than the authors findings [3]. The results of the present study revealed that parasitic infection was reduced compared to the previously published report. This may be due to the increased concern and affection of pet dog and cat owners towards pet dogs and cats.

Among 13.79% viral diseases in cats, the highest 6.6% cases were flu, and feline panleukopenia virus infection (4.12%), followed by feline infectious peritonitis infection. Yadav *et al*., reported that feline panleukopenia virus infection occurs in cats at 3.01%, which was consistent with the present findings [3]. On the other hand, in dogs, among 9.23% of viral cases, CPV was the highest (6.8%), followed by 2.43% of canine distemper infections. Recent findings of the prevalence of viral diseases were almost consistent with the findings of Yadav *et al*., as they reported CPV infection was 2.33%, which was less than recent findings followed by 1.74% of canine distemper infection, but the findings were much less than the findings of Singh *et al*., as they reported CPV infection in dogs was 24.03% [3-15]. The in-coordination between recent and previous findings might be due to geographical differences such as study area, study period, vaccination status, and emerging diseases.

Accidental injuries among non-infectious diseases were highest (5.34% and 4.44%), respectively, in both dogs and cats, which were less than the findings of William *et al*., who reported the occurrence of accidental injuries at 18.18% [18]. The author took falling from height and automobile injuries into consideration as accidental injuries, but William *et al*., might consider many complications as accidental injuries, such as animal bites, traumatic injuries, falling from height, insect stings, ingestion of foreign bodies, ripped nails, plant toxicity, etc., which resulted in the variation from the recent result [18]. Surgical cases, including fracture management, pyometra, dystocia correction, castration, spaying, etc., comprise 8.25% and 10.47% in dogs, respectively, which were almost coherent with the findings of Sarker *et al*., and Parvez *et al*., who reported surgical cases of approximately 15%.

Skin diseases (alopecia, dermatitis, and allergic problems) comprise the highest (16.99% in dogs and 4.6% in cats) percentage among non-specific diseases, which was almost aligned with the findings of Parvez *et al*., who reported skin problems in cats at 4% [11-16].

According to the age-wise distribution of the diseases of cats, the highest percentage of cat diseases was detected at a young age (46.3%) than at an old age (13.31%), which was consistent with the study of

Kouamo *et al*., who reported the percentage of clinical condition was high in young cats (<1 year) at 75.5% and adult cats (1-2 years) at 13.7%, but lowest in old cats (>2 years) at 10.9% [19]. The degree of feline panleukopenia virus infection varied significantly with age ($P < 0.05$), with young cats under 12 months of age being more susceptible to infection. This result was in accordance with Sykes research, which discovered that while feline panleukopenia primarily affects kittens under a year old, it can afflict cats of any age who are not vaccinated or who have vaccinated improperly [20]. The highest percentage (34.47%) of dog diseases were diagnosed in the adult age group (more than 12-36 months), followed by 21.80 in the old age group (more than 36 months). The recent findings were almost consistent with the findings of Sarker *et al*.,who found 37.33% of cases in adult dogs and 29.1% in old dogs [16]. Age was shown to have a significant impact on the degree of fracture ($P < 0.05$), with younger cats under 12 months old being more vulnerable.

The association of gender in relation to the distribution of diseases reveals that males were more susceptible than females, which was consistent with the findings of Sarker *et al*., and Yadav *et al*., [3-16]. The study reflected that gender had a significant impact ($P < 0.05$) on the magnitude of fungal infection, dystocia, fracture, and castration in cats, while in dogs, the association of gender showed a significant effect on pyometra ($P < 0.05$). The study conducted by Sarker *et al*., found that there was a substantial ($P<0.05$) difference in the prevalence of infectious and non-infectious disorders between male and female cats [16]. The limited sample size in their study may be the cause of this disparity.

Breed-specific differences in the prevalence of diseases were found to be statistically significant ($P<0.05$) for several diseases in dogs and cats. Among infectious diseases, dog flea and mite infestation were significantly ($P<0.05$) higher in the local breed than others, which was coherent with the findings of Parvez *et al*., [11]. In cats, HRS and castration showed significant ($P<0.05$) variation in Persian breeds compared to other breeds. The present findings were consistent with the findings of Sarker *et al*., as they reported that the prevalence of infectious and non-infectious diseases varied significantly ($P<0.05$) [16].

CONCLUSION

The current study has provided basic insight regarding the prevalence of dog and cat diseases and their distribution according to age, sex, and breed. In general, male dogs and cats had higher rates of the diseases or disorders that were documented than female dogs and cats. The age of the animal and gender are important predisposing factors for the development of diseases. Many factors, such as poor management, lack of awareness among owners, susceptible age, various exposure regions, different geographic distribution, habitat, etc., all contribute to the high incidence and prevalence of diseases and disorders. On top of this, the insights from the recent findings could be used as a baseline for future extensive research and might be useful for the formulation of productive disease control and therapeutic management strategies, including proper vaccination programs and public awareness campaigns.

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