AWARENESS OF ZOONOTIC DISEASES AMONGST CAT AND DOG OWNERS IN ASSAM, INDIA: A SURVEY

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Abstract:

Zoonotic diseases which are capable of being transmitted from animals to human. The rate of such transmission increases due to close contact between man and animals if man owns a pet. In the recent times it has been observed that the people of Assam, a Northeastern state in India, have significantly started to keep various animals as pets irrespective of any class or background. Therefore, it is important that the mass is aware of zoonotic diseases.

This work of interest finds relevance in conducting an online survey to determine the percentage of the population of pet owners in the state who are aware of zoonotic diseases. The aim is to popularize the importance on being aware of zoonoses.

A six month long online survey containing 47 close ended and 2 open ended questionnaires was conducted from 10 July 2021 to 10 December 2021 which resulted in 70.9% of the respondents confirming that they are aware of zoonotic diseases while 29.1% did not.

Although only a few percentages of respondents were unaware of zoonotic diseases yet this should be given equal importance. Steps should be taken up in a view to aware each and every pet owner in the state about zoonotic diseases.

Keywords: Awareness, Zoonotic, Vaccination, Pets.

Introduction:

Animals and humans have shared an amiable bond since the start of civilization. While animals have always been a source of various aids to man; man too provides them their necessities. As time passed man started owning pets like dogs and cats and treated them as an important member of their family. Pet ownership can be seen as a common attribute of today's society all over the world. However, the rate of pet owners varies across countries and different geographical locations. But more or less many surveys and studies have been carried out on the awareness of zoonotic diseases amongst both pet owners and non-pet owners.

Zoonotic diseases are caused by germs or any foreign entity carried by animals under natural conditions or any environmental change or activity. These animals when come in contact with humans might cause several kinds of zoonotic diseases. 13 zoonoses are the cause of 2.4 billion cases of human diseases and 2.2 million deaths per year (Jones et al. 2008; Aggarwal and Ramachandran2020). An estimated 60% of known infectious diseases and up to 75% of new or emerging infectious disease are zoonotic in origin (Woolhouse and Gowtage-Sequeria2005; Jones et al. 2008; Salyer et al.2017).

The zoonotic diseases which are caused by dogs and cats include viral zoonoses like Avian influenza, cowpox and bacterial zoonoses like Bite-Transmitted Bacterial Infections (*Pasteurellamultocida* and *Capnocytophagacanimorsus*), Methicillin Resistant *Staphylococcus aureus* (MRSA) Infection and Cat scratch disease (*Bartonellahenselae)* (Chomel2014). Viral infections such as rabies and norovirus and bacterial infections including Pasteurella, Salmonella and Brucella are the most common zoonotic diseases transmitted from dogs to human (Ghasemzadeh and

Namazi2015). In India, Central Bureau of Health Intelligence (CBHI) reported around 110 cases of rabies in 2018 (Kumar et al.2020). Besides these, dogs harbor a huge number of infective stages of parasites transmissible tohuman and other domestic animals including cutaneous and visceral larva migrans, hydatidosis and tungiasis as well (Sarmah et al.2013). As per zoonotic diseases are concerned, rabies is the most common and about 20,000 lives are lost every year due to rabies in India (Kumar et al. 2020).

Various previously conducted studies and surveys at international and national level directed towards unawareness about zoonotic diseases. One globally conducted study across the schools of Austria, Japan, Mauritius, Italy, Germany and Slovenia to check the adolescents' knowledge on zoonotic diseases indicated lack of awareness about animal transmitted diseases, importance of deworming and vaccinating their pets (Zucca et al.2021). A similar trend could be observed in a survey done on knowledge, attitude and practices relating zoonotic diseases among livestock owners in the state of Punjab, India. Only 40%, 31% and 25% farmers out of the ones participated were aware of the zoonotic nature of tuberculosis, Japanese encephalitis and taeniosis respectively. The low percentile sought for immediate actions towards better awareness about zoonotic diseases (Singh et al.2019). The scenario of unawareness was not limited to the rural backdrop but the situation was the same even in the well-developed urban sphere of the country. This was established through a study of 700 participants in the urban colony of East Delhi where it was observed that only one-third (34.2%) of the respondents were aware that pets are a source of disease (Cherian et al.2020). In the Northeastern part of India, very few studies have been carried out in regards to spread of awareness about zoonotic diseases. Among the few, one cross sectional survey was reported in the states of Odisha and Assam. 244 farmers were interviewed, none of them were aware of Brucellosis and its zoonotic risks. This clearly indicates the lack of proper information among them and that farming practices are associated with high risk of animal transmitted diseases (Leahy et al.2020). In view to the prevailing lack of knowledge and awareness about zoonotic diseases, this survey has been conducted as ample of research is required to mitigate the spread of zoonotic diseases by giving priority to its awareness among the population.

To save guard oneself and also their pets a proper knowledge about these diseases is a must for a population. Proper precautions like maintaining hygiene, taking necessary vaccination in time, consultations with physicians and veterinarians to remain informed about diseases transmitted from animals. The data collected from this survey report suggest that there is lack of awareness about these diseases and low practice of precautionary measures.

Methodology:

An online survey was organized for about 6 months through survey administration software called Google forms. The survey comprised of a questionnaire of about 49 questions. 47 of which were strictly close ended questions and 2 were open ended questions. The questionnaire was structured based on other various surveys conducted in regards to awareness of zoonotic diseases around the globe (Snedeker et al. 2012; Stull et al.2012, 2015; Alho et al. 2018; Ba et al. 2020; Yasobanta et al.2021). Expertise on pets and related facts on zoonotic diseases in Assam were also consulted. It enquired about the individual's and their pets' data; respondent's knowledge of zoonotic diseases; sources of information; infection from animal transmitted parasites in the past, attitudes regarding physical proximity with their pets and their daily activities associated with their pets. The questionnaire was shared amongst the pet owners of various districts of Assam by a random sampling method through several social media platforms. About 330 number of respondents voluntarily participated in the survey.

Results:

During the 6 months long survey in and about the Google form was shared to 400 pet owners out of which 330 participated in the survey.

The demographics of the respondents are such that: Number of Male participants: 142(56.4%), number of Female Participants: 186 (43%) while 2 participants (0.6%) belonged to some other gender. The maximum number which is 200 participants (60.6%) belonged to the age group 20 to 30.

The rest number of participants with respect to their age groups are-

Below 20-: 9(2.72%); 30 to 40 -: 53(16.06%); Above 40 -: 68(20.6%). Number of Urban area participants: 221 (66.96%) and number of Rural area participants:109 (33.03%). 7.6% of participants were veterinarian,14.5% health workers while 77.9% had other professional backgrounds. It was seen that dogs were the most common pets amongst the respondents of about 63.3% (209 out of 330) followed by cats of 26.6% (87 out of 330) and a mere 10.3% (34 out of 330) owning both dogs and cats. Most of the pets were of local breed of about 50.3% while Labradors of 12.1 %, German shepherd of 6.1%, Golden Retriever of 3.6 % and 27.6% of other breeds of pets were also owned in case of dogs. 63.8 % of pets were males and 36.2 % of pets were females. The pets belonged mostly to the age group of 0-5 years 76.1% followed by 20.6% of 6-10 years, 2.4% of 11-15 years and 0.6% of above 15 years.

It was observed that 79.7% respondents take their pets to the vet. Out of these,32.4% of respondents take their pets to vets once a few months,12.4% twice a month, 17.9% once a month and 4.5 % on a weekly basis. Respondents take the pets for vaccination, health checkups, when the pets get ill and other reasons as well.

Table 1: Respondents' attitude towards vaccination and consulting veterinarian.

Sl. No.	Reasons for taking pets to veterinarian.	No. of responses
1	Vaccination, Health checkups, illness and other reasons	17
2	Vaccination, Health checkups and Illness.	46
3	Vaccination, Health checkups and other reasons.	2
4	Vaccination, Illness and other reasons.	5
5	Vaccination and Illness.	21
6	Vaccination and other reasons.	2
7	Health checkups and Illness.	2
8	Health checkups and other reasons.	1
9	Illness and other reasons.	1
10	Vaccination and health checkups.	21
11	Vaccination only.	72
12	Health checkups only.	53
13	Illness only.	33
14	Other reasons.	54

The survey says that only 263 out of 330 (79.69%) participants takes their pet to the vet. Again out of these 263, only 186 participants vaccinated their pets time to time or as per required.

Also, 70.9% of respondents admitted of being aware of animal transmitted diseases and 29.1% respondents did not know about these diseases. 62.1% of respondents received information regarding animal transmitted diseases while 37.9% have not received any such information. 53.9 % are very concerned about transmitting diseases from animal and 36.1% investigate infection in their pets frequently.

The respondents also shared their preferences for acquiring information about zoonotic diseases.68.5% respondents entrust a veterinarian, 20.6% a physician, 25.8% family and friends,15.5% print media, 23% books, 31.5% social media and 40% from multiple sources.

72.4% responded of taking steps to prevent parasitic infection in pets. 64.2% vaccinate their pets with anti-

parasitic drugs and 51.8% deworm their pets from vets while 48.2% deworm by themselves. But 27.6% of respondents do not take any step towards prevention of parasitic infection and 35.8% do not vaccinate pets with anti-parasitic drugs. During the survey, it was asked to the participants about which diseases could be potentially caused through transmission from pets to humans. The response is shown in the table-2.

Table 2: - Respondents' knowledge about zoonotic diseases.

Sl. No.	Name of zoonotic diseases	No. of respondents
1	Rabies	223 (67.6%)
2	Intestinal worms	74 (22.4%)
3	Salmonella	33 (10%)
4	Diarrhea	37 (11.2%)
5	HIV-AIDS	6 (1.8%)
6	Ring worms	61 (18.5%)
7	No idea	83 (25.2%)

The follow-up query was to find out if the participants were aware of the possible ways in which zoonotic diseases are transmitted. The response showed that 56.6% participants believed that zoonotic diseases are mostly caused by claw scratches. Other responses have been put down in the table below:

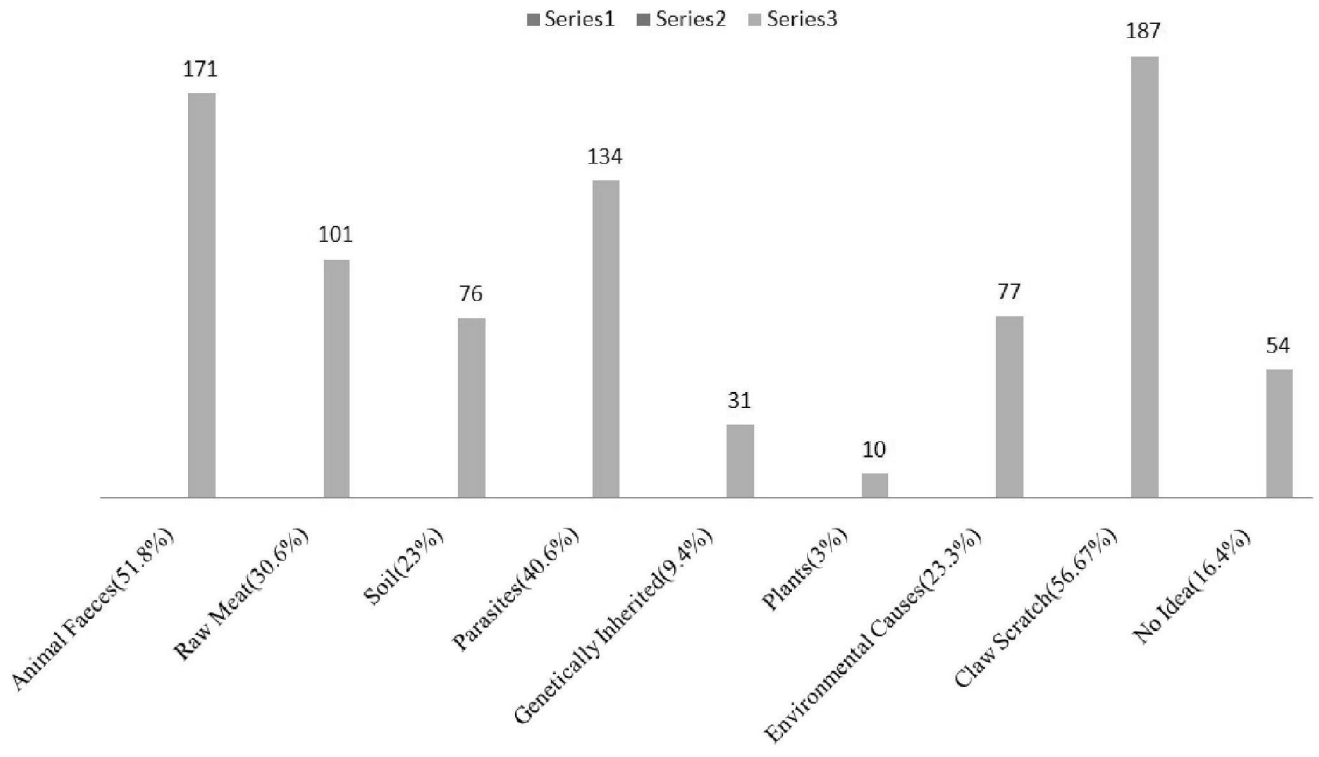

Figure 1: Respondents' knowledge about the possible ways to transmit zoonotic diseases.

A set of questions concerning about the activities of the participants associated with their pets were included in the survey (Table- 3)

Table 3: Respondents' activities associated with their pets.

Sl. No.	Variables	Yes (%)	No (%)
1	Are your poets allowed in your bedroom?	70.6	29.4
2	Are your pets allowed in your kitchen?	47.3	52.7
3	Do you sleep with your pets?	35.8	61.2
4	Do you allow your pets to lick you?	65.5	34.5
5	Are your pets strictly kept indoors?	48.2	51.8
6	Are your pets strictly kept outdoors?	23.9	76.1
7	Do you give access to your pets to come in contact with non-potable water such as surface water or bathroom bowls?	32.4	67.7
8	Do you take your pets for a walk in the public places?	68.8	31.2
9	Does your pets interact with other animals in the neighborhood?	62.4	37.6
10	Do you gather your pets' faeces and discard elsewhere?	60.3	39.7
11	Do you wear gloves while collecting their nails, hair and faecal matter?	63.3	36.7

68.5% of respondents keep pets as a companion followed by 24.2% who keep them for security purpose and 7.3% for pest control. And due to this emotional attachment of considering their pet as companion or even for other aids from pets 67.9% respondents believe that the benefits of keeping pets are higher than transmitting diseases from them.

59.4% participants admitted washing their hands after every single time they touch their pets, while 32.4% wash sometimes and 8.2% did not care to wash their hands after touching their pets. The survey also states that only 54.2% participants are actually very careful in maintaining a hygienic environment around their pets.

Discussion:

This study was to investigate the level of awareness about zoonotic diseases among the pet owners in Assam by testing the attitude and knowledge related to contact and activities with their pets. The study has acquired its result taking owners' contact with pets indoors or outdoors, pets' contact with other animals outside premises and the pets' habitual activities into consideration.

During the study, majority percentage of 70.9% respondents accepted to being aware of zoonotic diseases. Although, detailed queries on the same displayed the lack of appropriate approach towards taking prior steps in trying to learn about zoonotic diseases and in adopting the basic precautionary steps for the same. A detailed discussion about the respective queries are such that: physicians in the state of Assam do not ask patients if they own any pet or about their physical contacts with their pets as confirmed by 64.8% of the respondents. This displays failure on the part of the physician in considering zoonotic diseases as a possible cause for their respective patients. Also, only a 51.2% of respondents have discussed about zoonotic diseases with their veterinarian. While 48.8% do not consult about any of these diseases which clearly indicates a lack of discussion on zoonotic diseases. Further when questions were asked about vaccination and anti- parasitic drug, respondents were seen being aware of its importance. And as per hygiene factors are concerned, 65.5% of people allow pets to lick them, 70.6% of people allow them to enter their bedroom and even a 70.6% of people comes in contact with their pets when they are ill. Table 4 gives a detailed insight on the activities of the pet owners associated with dealing with their pets. The results imply that physicians, veterinarians and pet owners have room for improvement in handling a zoonoses free bubble while living with their pets. A bet-

ter communication should be initiated among various professions as well as making it a common topic of interest even among the common masses. Mouth to mouth awareness aided by more structured awareness programs and professional insights shall make a possible picture of cent percent awareness among the people of Assam, including both pet owners and non-pet owners but potential future pet owners.

But it has been observed that people are concerned about maintaining personal hygiene routines such as washing hands every time they touch their pets; wearing gloves while discarding their pets' waste materials and discarding the waste materials like faeces, body hair and nails in proper garbage place and dust bins. Due to these healthy hygiene habits, when it was surveyed if the respondents have ever been diagnosed with zoonotic diseases,84.2% people admitted of never been affected or suffered from any zoonotic diseases.15.8% people did suffer from zoonotic disease but the structure of the survey failed to enquire further details of which zoonotic disease they were affected by.

Only 33% of people could associate salmonella as a zoonotic disease causing organism. This can be viewed as a significant remark on the parameters of awareness about zoonotic diseases due to the increasing trend of raw meat diet which might be contaminated with *salmonella*. This low response for *salmonella* clearly justifies that 101 out 330(30.6%) of respondents feed their pets with raw meat. Nevertheless, 69.4% do not feed their pets with raw meat irrespective of whether they could associate *salmonella* as a possible way to transmit zoonotic diseases. This is one of the major steps to prevent zoonotic diseases and thereby shall be encouraged. Although the ones who were unaware of the association of *salmonella* are still a matter of concern and calls for immediate awareness on it.

There have been participants (16.4%) who responded having no idea about the possible ways of transmitting zoonotic diseases. Although it is a not a large figure yet draws attention to fill up the knowledge gap between heath care professionals and pet owners.

From the results obtained and data analyzed Assam's pet owners appeared to be well aware of zoonotic diseases although there is scope for adopting many measures to increase the awareness rate and also to improvise their habitual traits so as to prevent these diseases. But the low response makes it prone to errors and limits it from representing all the pet owners of the state. Rather it gives a general scenario of all the knowledge, attitude and practices of the participants with respect to their pets.

Conclusions:

The study stated result that a considerable amount of people owns a pet. This very fact itself ask for a sound knowledge and set of information regarding animal transmitted diseases. Since the result showcases maximum number of the respondents in the survey of being aware of zoonotic diseases yet the section unaware of the same cannot be ignored. These diseases can be easily prevented by adapting a few changes in the day to day activities by the pet owners while interacting with their pets.

Some of the factors which can reduce the rate of transmission of diseases from animals to humans are discussed below: -

1. Avoiding direct contact with sick pets
2. Wearing gloves or plastic covers while handling with the hair, nails or faecal matter of the pets.
3. Maintaining routine cleanliness around the pets and the environment in their contact.
4. Prohibiting pets from coming in contact with potable water, garbage, street animals.

Patients at risk of getting transmitted by any zoonotic disease from their pets can lower the risk by gaining appropriate knowledge about the diseases. It shall be assisted by veterinarians or physicians. Physicians should obtain a detailed report of the history of contact and related habitual actions of the patients with their pets.

The survey suggests that veterinarians and physicians do not discuss about the risks of having a pet with their patients or even with each other. This knowledge gap shall be bridged to bring sound awareness. Educating the people, suggesting books or even sharing trusted articles via mail can also install awareness in huge wave.

Along with the above mentioned personally adopted measures, the concerned authorities should also take necessary steps like organizing massive awareness programs such as distributing templates among general public, conducting workshops and seminars in educational institutes as well as in online platforms etcetera to make people understand about the importance of vaccines and to acknowledge them with the information required to pet an animal. Since, Assam has recorded a fair amount of zoonotic disease cases in the recent years, thereby works on the importance of its awareness should be prioritized. The goal is to make people of Assam get rid of these diseases and try to reduce its rate in the years to come.

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Statements & Declarations:

Competing Interest -: The authors declare that they have no conflicts of interest.

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