

COMMUNITY AWARENESS LEVEL ON ZONOTIC POTENTIALITY
OF CANINE LEPTOSPIROSIS: A CROSS-SECTIONAL SURVEY IN
CAUVERY DELTA REGION OF TAMIL NADU

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ABSTRACT

Leptospirosis is a globally important zoonotic disease with dogs serving as major reservoirs. Ascertaining the community awareness is essential for early diagnosis, prevention and control of disease transmission. A cross-sectional survey was conducted to assess the community knowledge on zoonotic potentiality of canine leptospirosis in Cauvery delta region (Thanjavur district) of Tamil Nadu, India using a structured questionnaire for collection of information regarding socio-demographic details and level of knowledge on transmission, symptoms and prevention of leptospirosis. Data were gathered from 141 participants, including pet owners, farm animal owners, and the general public, using different parameters. Educational status and age were highly significantly associated ($p < 0.001$) with awareness on leptospirosis, with younger respondents and those with higher education showing higher awareness on leptospirosis. Nearly half of the participants (46.1%) were unaware of transmission routes, and only 37.8 per cent participants recognized the leptospirosis as zoonotic disease. Awareness of clinical symptoms was limited (51.1%), with fever being the most recognized symptom (32.6%). Preventive measures such as avoiding contact with contaminated water sources (14.2%), hand hygiene (19.9%) and rodent control (17.0%) were poorly understood. Veterinary hospitals were the preferred treatment option (85.1%) than traditional methods and owner-directed medication. These findings highlighted the substantial gaps in awareness, underscoring the need for education, outreach and preventive practices to reduce canine-mediated leptospiral transmission and improve public health.

Keywords: Canine leptospirosis, zoonotic awareness, community knowledge,
Cauvery delta region of Tamil Nadu

Received : 21.11.2025

Revised : 14.03.2026

Accepted : 13.04.2026

¹M.V.Sc. student, Part of M.V.Sc. thesis submitted to Tamil Nadu Veterinary and Animal Sciences University.

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INTRODUCTION

Leptospirosis is a globally important zoonotic disease caused by pathogenic *Leptospira* species, which can infect a wide range of mammals (WHO, 2024; Abhijith and Apoorva, 2025). Dogs are both susceptible hosts and potential reservoirs, playing a key role in transmission to humans (Heydari *et al.*, 2025). In endemic regions, canine leptospirosis threatens animal health and increases zoonotic risk (Saran *et al.*, 2021). Transmission occurs primarily through contact with urine from infected animals, often via contaminated water or soil (Vishwakarma *et al.*, 2021). The disease ranges from mild, subclinical infections to severe multi-organ involvement, including renal, hepatic and pulmonary complications (Sarangi *et al.*, 2024) with pyrexia of unknown origin (PUO) at initial stages of infection in animals and human beings. Therefore, it is difficult for veterinarians and physicians to provide early diagnosis and timely treatment.

Awareness of its zoonotic potential is critical for the prevention and control of leptospirosis; however, knowledge gaps regarding transmission, symptoms, and preventive measures are widespread and heavily influenced by socio-demographic factors, such as education, age, and occupation (Jacob *et al.*, 2015; Arulmozhi and Natarajaseenivasan, 2017). This study evaluated the community knowledge and awareness on canine leptospirosis in Cauvery delta region (Thanjavur district) of Tamil Nadu, India to identify the gaps and follow the integrated one health strategies in prevention and control of leptospirosis in

animals, humans and reduce environmental contamination.

MATERIALS AND METHODS

Study Design and Population

A cross-sectional survey was conducted to assess community knowledge and awareness on zoonotic potentiality of canine leptospirosis following the standard epidemiological approaches (Thrusfield and Christley, 2018). A total of 141 respondents were participated in this survey comprising 75 males (53.1%) and 66 females (46.8%). Respondents were identified from both rural and urban areas in Cauvery delta region (Thanjavur district) of Tamil Nadu, India representing diverse socio-demographic backgrounds including pet owners, farm animal owners and general public with different parameters.

Data Collection

Information were collected using a structured questionnaire, a method commonly employed in zoonotic awareness studies (Said *et al.*, 2018; Saran *et al.*, 2021). The questionnaire included details on socio-demographic variables such as age, sex, education, residency and type of ownership, as well as questions assessing awareness of transmission routes of leptospirosis. In addition, respondents were asked about their knowledge of clinical symptoms in both animals and humans, their awareness of the zoonotic potential of the disease and their understanding of preventive measures and treatment preferences. To ensure accuracy and consistency, the questionnaire was

pre-tested for clarity and reliability before the study (Jacob *et al.*, 2015).

Conduct of Survey

Respondents were interviewed in person. Participation was voluntary and informed consent prior to data collection in line with World Health Organization (WHO) guidelines for leptospirosis surveillance and community studies (WHO, 2003). The survey was conducted in both rural and urban communities to ensure representation of different residency backgrounds.

Data Compilation and Statistical Analysis

The information collected from the respondents were compiled and coded in Microsoft Excel. Descriptive statistics (frequencies and percentages) were calculated to summarize awareness levels across categories. Associations between socio-demographic variables and awareness of leptospirosis were tested using the Chi-square test (Thrusfield and Christley, 2018). Statistical significance was set at $p < 0.05$, with highly significant associations noted at $p < 0.001$. Analyses were performed using IBM SPSS Statistics (IBM SPSS Statistics for Windows, Version 20.0, IBM Corp., Armonk, NY, 2011).

Ethical Considerations

The survey was conducted in accordance with institutional ethical guidelines for human participation. Confidentiality of respondents was maintained and data were used solely for research purpose.

RESULTS AND DISCUSSION

Socio-demographic Details and Awareness Level

The socio-demographic details and awareness level on canine leptospirosis were compared and provided in Table 1. A total of 141 respondents were surveyed, including 75 males (53.1%) and 66 females (46.8%). Educational status showed a highly significant association with awareness ($p < 0.001$), with degree holders reporting the highest awareness (50.9%), followed by office workers (40.0%), while those with informal education (20.0%) and school education (16.6%) showed poor knowledge. Age group was also highly significantly associated with awareness ($p < 0.001$), as younger below 25 years (45.7%) and those aged 26–40 years (46.1%) exhibited greater awareness than older groups, particularly those aged 41–60 years (14.2%). Residency did not show any significant difference ($p > 0.05$), with both rural and urban respondents reporting equal awareness levels (32.6%). Similarly, type of ownership was not significantly associated with awareness ($p > 0.05$), although pet owners had the highest awareness (44.1%), followed by owners of both pet and farm animals (33.3%), while farm animal owners (25.0%) and general public (26.8%) reported lower awareness.

Community Awareness of the Zoonotic Potential of Canine Leptospirosis

The knowledge regarding zoonotic potentiality on canine leptospirosis among respondents is given in the Table 2. Among 141 respondents, 53.1 per cent were male and

46.8 per cent were female with no significant difference ($p>0.05$). Regarding the mode of spread of leptospirosis, nearly half of the respondents (46.1%) were unaware of transmission routes, while drinking of urine-contaminated water (23.4%) was the most commonly recognized route, followed by contact with animal excreta or aborted materials (11.3%), contact during feeding, watering and cleaning of animals (7.8%), walking on stagnant water (8.5%), paddy or sugarcane field work (1.4%) and recreational water activities (2.1%) with highly significant statistical association ($p<0.001$). Awareness of animal symptoms varied, with fever (32.6%) and dullness or depression with reduced feed and water intake (20.6%) being most frequently identified, while other signs such as jaundice (9.2%), blood-tinged milk (7.1%), abortion in pregnant animals (6.4%) and rashes/itching (0.7%) were less commonly reported; notably, 48.9% of respondents were unaware of clinical signs in animals with highly significant association ($p<0.001$). For human symptoms, fever (43.3%) and severe body and joint pain (17.0%) were most commonly recognized, while jaundice (13.5%), reddening of conjunctival membranes (7.1%) and rashes (5.0%) were less known, and 44.7 per cent of respondents were unaware of human symptoms with highly significant association ($p<0.001$). When asked about zoonotic awareness, only 37.6 per cent of respondents recognized leptospirosis as a zoonotic disease, while the majority (62.4%) were unaware of its zoonotic potential ($p<0.001$) (Fig.1). Regarding preventive measures, vaccination in animals (54.6%) was most frequently reported, followed

by washing of hands after handling dogs (19.9%), controlling of rodents (17.0%) and avoiding contact with contaminated water sources (14.2%), with 36.2 per cent unaware of preventive strategies ($p<0.001$). In terms of treatment preference, the vast majority (85.1%) preferred veterinary hospital care, while only a few opted for traditional methods (1.4%), a combination of veterinary and traditional care (2.8%), owner-directed medication (2.1%), or were unaware (8.5%) ($p<0.001$). Overall, the survey reflected the moderate awareness of leptospirosis symptoms, transmission and prevention strategies among respondents, though significant gaps remain, particularly regarding zoonotic potential, emphasizing the need for targeted educational interventions.

The study highlighted the substantial gaps in community awareness on canine leptospirosis and its zoonotic potential. Educational status and age were significantly associated with awareness, with degree holders (50.9%) and younger individuals (<25 years, 45.7%) showed higher knowledge, while residency and type of ownership had no influence. These findings align with Saran *et al.* (2021), who reported the lower level of leptospirosis knowledge among less educated people. Jacob *et al.* (2015) noted the improved awareness after structured health education programs in Chennai, Tamil Nadu. Residency did not influence awareness which is in contrast with Saran *et al.* (2021) who observed slightly higher level of awareness among urban dog owners. Type of ownership was also not significant, whereas Saran *et al.* (2021)

found higher awareness among individuals with direct animal exposure.

Regarding transmission, nearly half of the respondents (46.1%) were unaware, only 23.4 per cent of respondents recognized drinking water contaminated with urine and 11.3 per cent recognized contact with animal waste as transmission routes. This is in accordance with Said *et al.* (2018) in Tanzania, who reported that dog owners often misunderstood transmission. Arulmozhi and Natarajaseenivasan (2017) reported less than 20 per cent recognized rats as primary transmitters.

Awareness on clinical symptoms was limited. Fever was the most commonly reported symptom by respondents in animals (32.6%) and in humans (43.3%), while nearly half of the respondents were unaware of any symptoms which is consistent with the findings of Sarangi *et al.* (2024), who emphasized that misinterpretation of clinical signs delays diagnosis and treatment.

Vaccination in animals was the most frequently reported preventive measure (54.6%), yet 36.2 per cent had no knowledge about prevention of leptospirosis. Rodent control and sanitation were rarely mentioned, however Vishwakarma *et al.* (2021) and Anand *et al.* (2023) who highlighted the importance of environmental interventions. Treatment was primarily sought from veterinary hospitals (85.1%) with minimal reliance on traditional methods (1.4%), which is accordance with Nozmi *et al.* (2018) who reported that attitudes and preventive practices on

leptospirosis among rural communities are still low. The survey indicated the low level of knowledge, attitudes and preventive practices of leptospirosis. So, planning and implementation of effective awareness education programmes regularly to the people living in leptospirosis prone geographical areas is still warranted.

CONCLUSION

This study showed that community awareness on canine leptospirosis and its zoonotic potential is limited in Cauvery delta region (Thanjavur district) of Tamil Nadu, India with major gaps in knowledge on transmission routes, clinical symptoms and preventive practices. Educational status and age were main factors, with younger and more educated respondents showing better knowledge, while residency and type of ownership had no effect. Nearly half of respondents were unaware of basic aspects of the disease and only one-third recognized its zoonotic nature. Preventive measures such as vaccination in animals, rodent control and environmental sanitation were poorly understood and misinterpretation of clinical signs hinders early diagnosis. Although veterinary hospitals were preferred for treatment, lack of awareness highlighted the need for targeted education and outreach. Strengthening one health approaches through integrated veterinary and human health, environmental sanitation efforts, community awareness campaigns and inclusion of leptospirosis education in public health programmes is essential to improve animal and public health in leptospirosis endemic regions.

Table.1. Distribution of study participants based on socio-demographic characteristics

Variables	Parameters	No. of Respondents	No. aware of leptospirosis (%)	P value
Educational status	Informal education	10	2 (20.0)	p<0.001
	School education	60	10 (16.6)	
	Degree holders	51	26 (50.9)	
	Office worker	20	8 (40.0)	
Age	< 25 years	70	32 (45.7)	p<0.001
	26 – 40 years	13	6 (46.1)	
	41 – 60 years	56	8 (14.2)	
	Above 61 years	2	0 (0)	
Residency	Rural	92	30 (32.6)	p>0.05
	Urban	49	16 (32.6)	
Type of owners	Pet owners	43	19 (44.1)	p>0.05
	Farm animal owners	36	9 (25.0)	
	Owners of both pet and farm animals	21	7 (33.3)	
		41	11 (26.8)	

Note: p>0.05 = Not significant; p<0.05 = Significant; p<0.001 = Highly significant

Table.2. Awareness level on zoonotic potentiality of canine leptospirosis among respondents

Category	Parameters	No. of Respondents (%)	P value
Sex	Male	75 (53.1)	p>0.05
	Female	66 (46.8)	
Mode of spread	Contact with animal excreta/ aborted materials	16 (11.3)	p<0.001
	Contact during feeding, watering and cleaning of animals	11 (7.8)	
	Drinking of urine-contaminated water	33 (23.4)	
	Walking on stagnant water (rainy season/fields)	12 (8.5)	
	Paddy field/sugarcane field work	2 (1.4)	
	Recreational water activities (swimming in ponds/pools)	3 (2.1)	
	Unaware	65 (46.1)	

Symptoms in animals	Abortion in pregnant animals	9 (6.4)	p<0.001
	Blood-tinged milk	10 (7.1)	
	Dull/depressed, not taking feed/ water	29 (20.6)	
	Fever	46 (32.6)	
	Jaundice	13 (9.2)	
	Rashes/Itching	1 (0.7)	
	Unaware	69 (48.9)	
Symptoms in humans	Fever	61 (43.3)	p<0.001
	Jaundice	19 (13.5)	
	Severe body pain and joint pain	24 (17.0)	
	Rashes	7 (5.0)	
	Reddening of conjunctival mucus membrane	10 (7.1)	
	Unaware	63 (44.7)	
Preventive measures	Vaccination in animals	77 (54.6)	p<0.001
	Controlling of rodents	24 (17.0)	
	Washing of hands after handling dogs	28 (19.9)	
	Avoiding contaminated with water sources	20 (14.2)	
	Unaware	51 (36.2)	
Treatment preference	Veterinary hospital	120 (85.1)	p<0.001
	Traditional method	2 (1.4)	
	Veterinary + Traditional	4 (2.8)	
	Owner-directed medication	3 (2.1)	
	Unknown	12 (8.5)	

Note: p>0.05 = Not significant; p<0.05 = Significant; p<0.001 = Highly significant

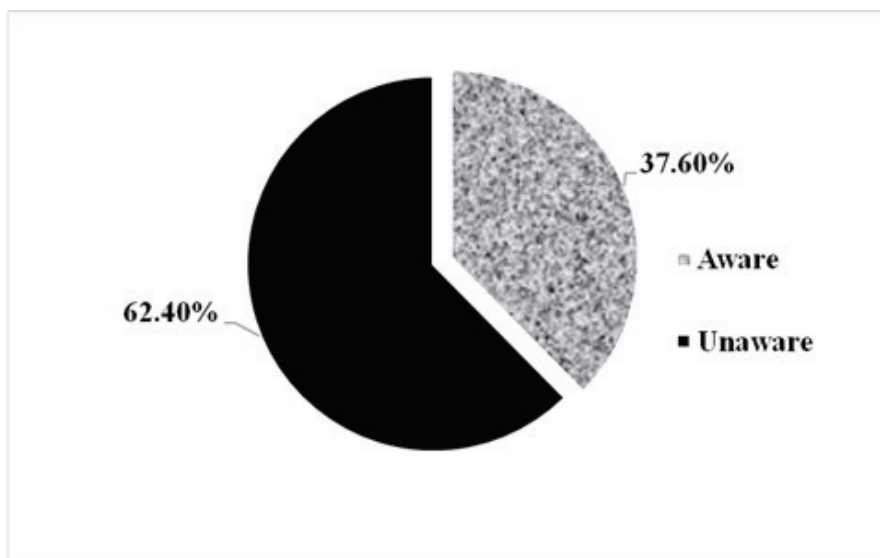


Fig.1. Awareness level on zoonotic nature of leptospirosis among participants

ACKNOWLEDGEMENT

The authors are thankful to Tamil Nadu Veterinary and Animal Sciences University, Chennai for the facilities and financial support provided to carry out this research work as part of M.V.Sc. degree programme at the Department of Veterinary Public Health and Epidemiology, Veterinary College and Research Institute, Orathanadu, Thanjavur district, Tamil Nadu, India.

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