



International Journal of Veterinary Sciences and Animal Husbandry



ISSN: 2456-2912
NAAS Rating (2026): 4.61
VET 2025; SP-11(8): 13-18
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www.veterinarypaper.com

Received: 14-05-2026

Accepted: 18-06-2026

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Knowledge and awareness associated with the canine related zoonotic diseases (Rabies & Leptospirosis) among pet owners in Secunderabad

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DOI: <https://www.doi.org/10.22271/veterinary.2026.v11.i8Sa.3675>

Abstract

Zoonotic diseases are very commonly noticed in and around the world. A thorough knowledge and understanding regarding the potential health hazards particularly regarding Zoonotic diseases transmission and prevention among pet owners is very crucial. Hence the current study was undertaken to understand and to create the knowledge and awareness among pet owners regarding Rabies and Leptospirosis among the pet owners in Yaprul, Secunderabad. A cross sectional study was conducted using a closed-ended semi structured questionnaire by selecting 100 pet owners using random method. It was noticed that majority of the respondents had medium level of knowledge (53 per cent), followed by low level (37 per cent) and high level (10 per cent) based on the questionnaire on Rabies and Leptospirosis.

Keywords: Leptospirosis, pet owners, rabies, zoonotic diseases

1. Introduction

Human-canine bonding is the relationship between dogs and humans that can be traced back to at least 15,000 years ago. Psychologists believe that the relationship between human and canine is a bidirectional attachment bond, which resembles that of the typical human caretaker/Infant relationship and shows all the usual hallmarks of a typical bond.

The adverse impact of SARS-CoV-2 (COVID – 19) on mental and physical health has been witnessed across the globe. Associated mental health and wellbeing issues include stress, prolonged social isolation, boredom and anxiety. Because of this boredom and prolonged social isolation, there has been a dramatic increase in people showing interest in rearing of pets. As per 8 July 2021, households bought 3.2 million pets in lockdown. Studies also proved that pets had some impact on improved psychological health of their owners and could be integrated into recovery frameworks for promoting mental health and wellbeing.

A thorough knowledge and understanding regarding the potential health hazards particularly regarding Zoonotic diseases transmission and prevention among pet owners is very crucial. Zoonotic diseases are those diseases that are caused by harmful germs like viruses, bacterial, parasites, and fungi which are carried by animals and have the potential to spread to humans and cause illness. Zoonotic diseases are very commonly noticed in and around the world. Scientists estimate that more than 6 out of every 10 known infectious diseases in people can be spread from animals, and 3 out of 4 new or emerging infectious diseases in people come from animals (as per CDC report).

An updated literature survey indicated that 816 of 1407 (58 per cent) human pathogens which included viruses with prions (208), bacteria with rickettsia (538), fungi with microsporidia (317), protozoa (57) and helminths (287) were Zoonotic in nature. Of these 77 (37 percent), 54 (10 percent), 22 (7 percent), 14 (25 percent) and 10 (3 per cent) were emerging or re-emerging respectively (Kumar *et al.*, 2015) [5].

Zoonotic diseases cause significant health and economic impact in developing countries such as India. Lack of knowledge on the disease transmission, prevention and control measures is a

potential high risk for the occurrence of Zoonotic diseases. Rabies is a fatal viral Zoonotic disease caused by lyssa virus which is transmitted through dog bite and it affects warm-blooded animals and humans. It is more prevalent in Asia, Africa and Latin American countries an estimated 59,000 human deaths annually in over 150 countries, with 95 per cent of cases occurring in Africa and Asia. Due to underreporting and uncertain estimates, this number is likely a gross underestimate. Leptospirosis is another Zoonotic disease with epidemic potential, especially after a heavy rainfall, caused by a bacterium called *Leptospira*. It is estimated that more than 1 million cases occur worldwide annually, including almost 60,000 deaths. Despite this, there is limited information about public knowledge on pet husbandry and disease control practices. Many of the disease risks that occur with pet contact can be reduced through simple measures, such as hand hygiene, proper animal husbandry, altered animal contact behaviours and proper regular vaccination of their pets. Thus, awareness among the pet parents regarding these is a pre-requisite for effective disease prevention.

2. Review of Literature

Khadija *et al.* (2018) ^[4] conducted a study to determine the awareness of canine leptospirosis among dog keeping communities in Morogoro, Tanzania using a semi-structured questionnaire among randomly chosen dog owners. A total of 124 dog owners participated in the study. Among them 79 per cent were male and 21 per cent were female. Of them, 18.5 per cent had no formal education and only 4.8 per cent were graduates. The survey revealed that majority of the respondents (n=112) had never heard of canine leptospirosis. The remaining (n=12) knew about the disease from different sources including neighbours with sick dogs, livestock field officers, veterinarians, brochures, radio and television. When asked about the clinical signs, none of the respondents knew about the clinical signs, the way it is transmitted or controlled. However, they knew canine rabies as the only zoonotic disease human can get from dogs.

Goh *et al.* (2019) ^[2] of Malaysia evaluated the dog handlers' knowledge, attitude and practice (KAP) towards leptospirosis. Four working dog and four dog shelter organisations were approached. A total of 138 dog handlers were conveniently recruited and evaluated on their level of knowledge, attitude and practice towards leptospirosis using a validated structured questionnaire. Most of the dog handlers were male aged between 30 and 40 years with a wide range of working experience of 1-10 years and all of them have no formal training about leptospirosis. The majority of the dog handlers from the dog shelters had poor knowledge (90 per cent, n = 34/38) and attitude (100 per cent, n = 38/38) and moderate practice (53 per cent, n = 20/38) towards leptospirosis, whereas the working dog handlers had poor knowledge (58 per cent, n = 58/100) and attitude (75 per cent, n = 75/100) but a good level of practice (77 per cent, n=77/100).

Tiwari *et al.* (2019) ^[10] conducted a survey on 127 rural residents in Shirsuphal village in western India using a structured questionnaire to assess the knowledge, attitudes and practices of the pet/ livestock owning respondents towards Rabies and free roaming dogs. About 70 per cent (n=89) of the respondents were male and 30 per cent (n=38) were female, of which 50 per cent (n=64) belonged to the age group of 18-34 and the other 50 per cent (n=63) were 35 years and above. The socio-economic status of 41 per cent (n=52) respondents was high/middle class whereas the other 59 per cent (n=75) belonged to low class. Most respondents (97 per

cent) had heard of rabies. Of these 98.4 per cent knew that rabies could be transmitted through animal bites, although less than half (40.7 per cent) were aware that it could also be transmitted through licks/scratches. Most people (86 per cent) knew that rabies was fatal once acquired and 80 per cent were aware that it could be prevented. A majority of the respondents (87 per cent) were aware of the ineffectiveness of traditional applications, such as chilli/turmeric powder. Less than half (42 per cent) of respondents believed that washing bite wounds with soap and water was beneficial.

3. Materials and Methods

3.1 Area of study

Secunderabad is a city located in Telangana state of India. It is a twin city and one of the six zones of the Greater Hyderabad Municipal Corporation. Population density is about 8600/sq miles. It is situated in the North of Hyderabad at 17.45°N 78.5°E., Secunderabad lies on the Northern part of Deccan Plateau. Most of the area has a rocky terrain and some areas are hilly. The map given below gives an idea regarding the location of secunderabad in Telangana state and in India respectively.

3.2. Sampling Procedure

3.2.1. Selection of Respondents

A total of 100 pet owners were selected randomly who visited the pet clinic named "All Creatures Animal Clinic" along with their dog for check-ups.

3.3 Research Design

A cross sectional study was conducted using a well-structured questionnaire which was focused on assessing the public knowledge, attitude and practices towards pet husbandry, contact-related attitude, sanitation practice and their knowledge on canine Zoonotic diseases.

3.4 Tool for the study

A three-page structured questionnaire was prepared containing 42 questions. Due to the lack of a 'gold standard tool' for assessing knowledge on zoonoses, the content validation of the questionnaire was done via a series of expert reviews.

3.4.1. Construction of Interview schedule

A structured format was used for the expert reviews, wherein the following was examined: the technical content, comprehensiveness, its ability to test the deep knowledge, awareness and practices generally followed by the clients, level of difficulty and appropriateness. The choice and wording of the individual questions was reviewed by experts.

3.4.2. Pre- testing of the study proforma

Being a new study, prepared questionnaire was tested on 10 non- sample dog owners. On the basis of experience gained by this sample testing, necessary modifications were incorporated in the final format.

3.4.3. Method of data collection

The respondents were contacted personally during their waiting period in the clinic for the collection of the data. Before giving the questionnaire, investigator introduced herself to the respondents and the objectives were explained to them with a view to facilitate free response. Then questionnaire was given to respondents and were asked to select the choice which they feel it as appropriate.

3.5. Selection of Variables

The selection of the variables included in the study was done on the extensive review of literature on the subjects and discussion with the experts. Only those variables which were having relevance with the study were finally selected.

3.5.1 Dependable variables

S. No	Variables	Measurement technique
1.	Level of knowledge of dog owners about canine related zoonotic diseases	Structured proforma was developed.
2.	Level of adoption for prevention of canine related zoonotic diseases	Structured proforma was developed.
3.	Level of knowledge of Dog owners about dog bite prophylaxis	Structured proforma was developed.

3.5.2 Independent variables

S. No	Variable	Measurement technique
1.	Age	Chronological age of dog owners
2.	Sex	Sex of the individual
3.	Education	Formal education attained by the respondent

3.6. Measurement of Variables

The independent and dependent variables were measured with the help of a structured questionnaire.

3.6.1. Measurement of dependent variables

The dependent variables were designed to assess the level of knowledge of dog owners about canine related zoonotic diseases and dog bite management. The responses from the respondents were obtained against each item in terms of their correct responses or incorrect responses. The score of 1 was assigned to the correct option selected and zero for the wrong option selected. To know the score of knowledge of respondent's, sum of score of each response was obtained.

3.6.2. Measurement of independent variables:

3.6.2.1. Age

The actual age at the time of filling the questionnaire was considered to quantify this variable of the respondents. Dog owners were classified into 3 groups i.e., young age group (up to 30 years), Middle age group (31 to 50 years) and old age group (above 50 years).

3.6.2.2. Sex

The individuals selected for the study were classified based on the sex into two categories i.e., male and female.

3.6.2.3 Education

The highest acquired formal education at the time of filling of the questionnaire was taken into consideration. Dog owners were classified into 5 categories based on what they have studied i.e., Matric, Intermediate, Graduation, Post-graduation or any other technical qualification.

3.7. Statistical framework used for analysis of data

The raw data was classified, tabulated and analysed to make findings meaningful for interpretation and drawing conclusions. Some of the data are presents as frequencies and percentages. The relationship between dependent and independent variables was made using Pearson's coefficient method.

3.7.1 Frequency and percentage

The frequency distribution of the respondents was worked out and expressed out in terms of percentages. Simple comparisons were made on the basis of frequency and percentage.

3.8. Awareness creation following survey

Awareness was created among the owners who do not have any idea regarding the zoonotic diseases. Many queries regarding Rabies and Leptospirosis from the owners was explained in detail personally.

4. Results

In line with the objective of the study, information collected from the pet owners was analysed and subjected to various statistical tools and the results are presented below.

4.1 Profile of the dog owners

4.1.1 Personal variables

4.1.1.1 Age

Age plays a very important role in the psychological development and as age progresses people tend to learn many things out of experience. Hence, the respondents were classified into 3 groups based on their age i.e., Young age group (< 30 years of age), middle age group (31 to 50 years of age) and old age group (above 50 years of age) and was tabulated below:

Table 1: Distribution of Dog owners according to their age

S. No	Age group	Number	Percentage
1.	Upton 30 years	47	47
2.	31 to 50 years	46	46
3.	Above 50 years	7	7
	Total	100	100

The results presented in the table indicate that about 47 per cent (n=47) of the respondents belonged to young age group, 46 per cent (n=46) belonged to middle age group and 7 per cent (n=7) belonged to old age group. The data thus indicates that majority of the respondents fall into the category of young age group followed by middle age group.

4.1.1.2 Gender

Gender is the outward manifestation of the personality. However, gender has no role to play with the type of knowledge an individual has. Based on the type of gender an individual possesses, the respondents were divided into two major groups i.e., male and female. The data is analysed, and the results are shown in the table 2.

Table 2: Distribution of dog owners according to their gender

S. No	Gender	Number	Percentage
1.	Male	64	64
2.	Female	36	36
	Total	100	

It is evident from the data that maximum number of respondents were males i.e., 64 per cent followed by females i.e., 36 per cent.

4.1.1.3 Education

Education is an important factor that modifies one's behaviour. It also brings awareness and enlightens the mind

with abundant knowledge. Based on the data collected, respondents were classified into 5 categories i.e., Matric (10th class), Intermediate (11th and 12th standard), Graduation, Post-graduation and any other technical qualification. The data was analysed and tabulated in the table 3.

Table 3: Distribution of dog owners according to their educational qualification

S. No	Educational qualification	Number	Percentage
1.	Matric	3	3
2.	Intermediate	8	8
3.	Graduation	46	46
4.	Post – graduation	40	40
5.	Technical qualification	3	3
	Total	100	

From the above data analysis, three per cent of the respondents completed 10th class, eight per cent completed intermediate, 46 per cent completed their graduation, 40 per cent completed their post- graduation and 3 per cent were having some other technical qualification. Hence, it clear from the tabulation that most of the respondents completed their graduation and post- graduation.

4.2 Level of knowledge of dog owners regarding rabies and leptospirosis

In the present study, knowledge was considered as the body of understood information possessed by dog owner about zoonotic diseases. Knowledge was operationalized using a teacher made scale. The responses from the respondents were obtained against each item in terms of their correct responses or incorrect responses. There were 18 items of knowledge (appendix 1). The score of 1 was assigned for correct responses and zero for all incorrect responses. To know the score of knowledge of respondent's sum of score of each response was obtained. The respondents were classified into 3 groups using arbitrary method of classification viz. Low (<6), Medium (6-12), High (>12). The data regarding their knowledge level is depicted in the table below.

Table 7: Scoring of the respondents to the knowledge about canine related zoonotic diseases rabies and leptospirosis

Scoring	Number	Percentage
Less than 6	37	37
6- 12	53	53
More than 12	10	10

From the data, it was clear that 37 per cent of the respondents had low knowledge, 53 per cent had medium knowledge and 10 per cent had high knowledge. Hence it is clear that majority of the respondents had medium knowledge followed by those with low knowledge.

The items of knowledge included awareness regarding both the viral zoonotic disease “Rabies” and the bacterial zoonotic disease “Leptospirosis”. The questionnaire included 5 questions exclusively on Leptospirosis and 11 questions on Rabies and 2 questions regarding both. The tables presented below gives an idea about the amount of knowledge the respondents have on individual diseases.

Knowledge on Leptospirosis: The respondents were classified into three groups based on their knowledge on leptospirosis i.e., Low (zero marks), Medium (1-3 marks) and high (more than three).

Table 8: Scoring of the dog owners based on their knowledge on leptospirosis

Score	Number	Percentage
Zero	71	71
1-3	25	25
More than three	4	4

From the analysed data, 71 per cent of the respondents have no knowledge regarding Leptospirosis and 25 per cent of the respondents had medium knowledge and only 4 per cent of the respondents had high knowledge regarding leptospirosis.

Knowledge on Rabies: The respondents were classified into three groups based on their awareness on the zoonotic disease rabies i.e., low (<4 marks), medium (5-8 marks), high (9-11 marks).

Table 9: Scoring of the dog owners based on their knowledge on rabies

Score	Number	Percentage
<4 marks	40	40%
5-8 marks	30	30%
9-11 marks	30	30%

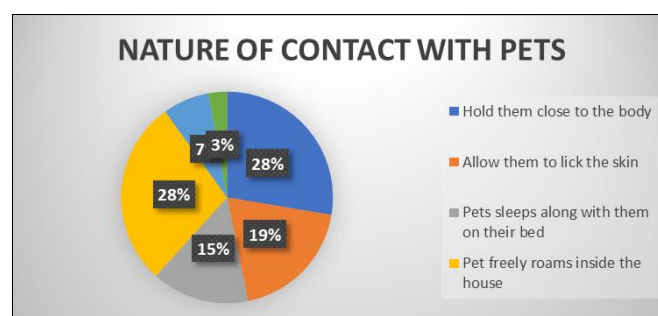


Fig 1: Response of the pet owners regarding their nature of contact with their pets

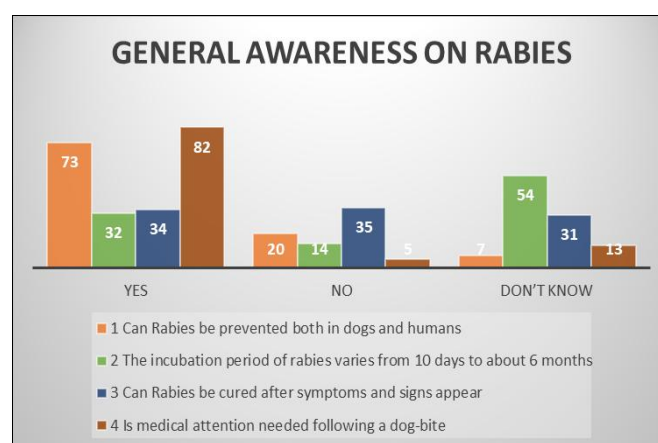


Fig 2: Response of the pet owners on the questions regarding general awareness on rabies

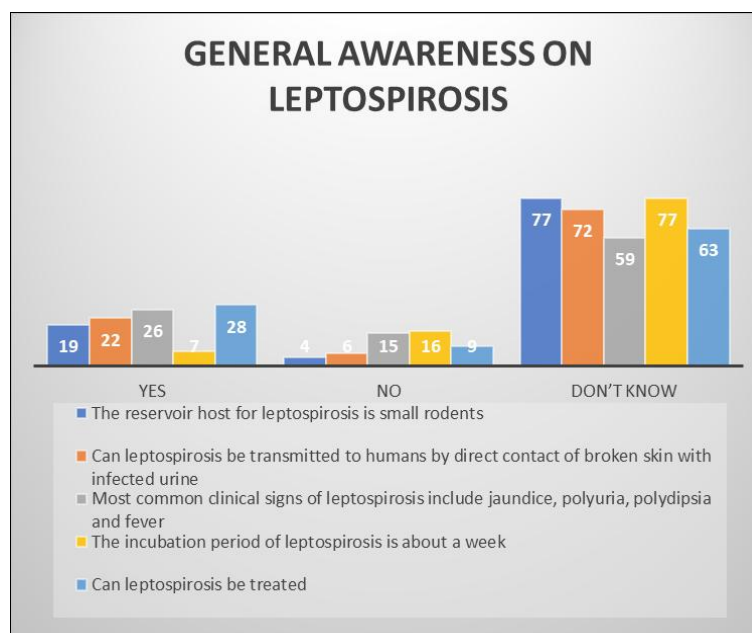


Fig 3: Response of the pet owners on the questions regarding general awareness on leptospirosis

4.3 Awareness Creation Following Survey

A glance into the questionnaire which was filled by the pet owner immediately after receiving it, gave an idea about the awareness level of that pet parent on Zoonotic diseases such as Rabies and Leptospirosis. With the use of one to one communication, the lacunae that the pet parent had on the awareness was fulfilled and many of their doubts were clarified.

5. Discussion

As pet-human contact occurs frequently and hence disease transmission is an aftermath which follows it posing a substantial health risk. As there are practices that increase pathogen exposure and individuals hence this study aimed to assess household knowledge, attitudes and risks related to zoonotic diseases and dog bite management among pet owners in Yaprak, Secunderabad. This study is unique in the aspect that this sort of research had not been done in that part of the city.

The age- group ratio of the participants was almost the same with young and middle-aged group people i.e., 47 per cent of the participants belong to young age and 46 per cent belong to middle age group, this finding was in contrast to with the findings reported by Rumana *et al.* (2013) [7] where the age of the respondents mostly belonged to the middle age group.

The females usually belonged to empathy towards their pets rather than males and the study could observe that female pet owners were more concerned about their pet dogs and they had more awareness than males proportionately. About three - fourth of the dog owners kept 1 dog (75 per cent), followed by 2 dogs (23 per cent), 3 dogs (1 per cent) and lastly more than 3 dogs (1 per cent). This trend must be due to the influence of the children that a dog is kept or for security purpose and those who owned more than 3 dogs was involved in dog breeding by profession.

The dog-owner relationship is solidified by the anthropomorphic attitudes of the owners toward their pets and it is influenced by the social role played by the dog in the family (companion/family member or a working pet). Most of the participants were graduates followed by post- graduates. Thus, this finding was similar to that of Fontaine *et al.* (1989)

[1] and Joice *et al.* (2016) where most of the respondents were graduates.

It was noticed that owners were dependent on local veterinarians and internet for sources providing information regarding the welfare and management of the animal. These findings were in accordance with that of Stull *et al.* (2012) [8] findings. Based on the results, it was clear that about 26.5 per cent of the pet owners lack awareness on Rabies and about 69.6 per cent of the pet owners lack awareness on leptospirosis. These findings were in accordance with that of Goh *et al.* (2019) [2] findings.

Rabies is an infectious viral disease that is almost always fatal following the onset of clinical symptoms. In up to 99 per cent of cases, domestic dogs are responsible for rabies virus transmission to humans. Yet, rabies can affect both domestic and wild animals. It is spread to people through bites or scratches, usually via saliva. In the current study most of the dog owners had medium to high level of knowledge regarding rabies and dog bite management and this may be due to the lack of complete awareness regarding rabies. Most (82 per cent) of them knew that following a dog bite the concerned person has to rush to a nearest doctor or to the hospital and not the native or traditional healers. Around 69 per cent of the respondents even knew that post bite, immediately the wound must be washed with soap and water for 15 min which is in accordance with the findings of Rinzin *et al.* (2016) [6]. The present study showed a similar result when compared it with a study conducted by Tschopp *et al.* (2016) [11] and Kamble *et al.* (2016) [3].

The overall knowledge and awareness among the respondents regarding leptospirosis is very low compared to Rabies. Awareness among those who completed their post-graduation is better compared to others. Age of the respondents did not show much variation in the awareness regarding the Zoonotic diseases. More proportion of people owning a dog for at least more than a year had medium level of knowledge and awareness. More females proportionately had medium level of knowledge compared to males. Though they are vaccinating their pets regularly, most of the respondents do not even know whether their pet is vaccinated against leptospirosis or not. Though the proportion of people having

awareness regarding the rabies are comparatively higher, still about 25 per cent of the people believed in traditional healing methods in dog-bite cases.

6. Conclusion

The findings of the study revealed that there was a dearth in the knowledge among pet owners on zoonotic diseases. As awareness of zoonotic disease risk is a prerequisite for effective prevention, the limited zoonotic disease knowledge of the public is a concern. Despite an increased awareness by researchers over the past several decades of the wide scope and magnitude of zoonotic diseases, the public's knowledge appears to have changed only little; as most of them were aware about the correct classification of rabies and routes of transmission. The low zoonotic disease awareness observed by respondents was perhaps not surprising as less than one third of respondents reported having ever received information about pet-associated diseases or precautions to reduce the risk of these diseases. As previously noted, veterinarians and the Internet were most frequently reported as providing this information to pet owners. The limited involvement and shallow nature of physicians and public health was not surprising. Several studies have indicated that physician's knowledge with regards to zoonosis is the main reason why people often rely on veterinarians for advising the public about the potential for zoonotic disease.

It is true that findings of the single study are inadequate to make any generalizations. Hence such studies should be repeated after some lapse of time. A poster was prepared for the general awareness of public regarding rabies and its prevention as it was found after conducting the study that the knowledge what people have regarding rabies and leptospirosis is inadequate and a mass awareness is required. Through this work, by using one to one communication technique awareness was provided regarding rabies and leptospirosis.

Acknowledgement

The authors are grateful to Kerala Veterinary and Animal Sciences University, Pookode for providing the grants to carry out the work. We are also thankful to the Dr. Rohit Kumar Veterinary Surgeon, Head of the Organisation, All Creatures Animal Clinic, Yaprul, Secunderabad for granting permission to collect the data from the pet owners.

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article

Swathi G, Prejit. Knowledge and awareness associated with the canine related zoonotic diseases (Rabies & Leptospirosis) among pet owners in Secunderabad. *International Journal of Veterinary Sciences and Animal Husbandry*. 2026;SP-11(8):13-18

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