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Research Article

Assessment of Knowledge, Attitude and Practices of Dog Owners on Rabies in The Sunyani Municipality

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Abstract: Understanding the knowledge, attitudes, and practices (KAP) of dog owners is crucial for implementing effective rabies control and prevention strategies. This study aims to assess the KAP of dog owners regarding rabies in the Sunyani Municipality, Ghana. A cross-sectional survey was conducted among 150 dog owners. The findings revealed that 90.7% of the respondents were aware of rabies. The majority, 123 (90.4%), believed it is preventable. Most of the dog owners, 129 (94.9%) stated that it is principally transmitted through dog bites. Hundred and twenty-seven (93.4) believed rabies is a risk to human health, and it is important to vaccinate dogs as a preventive measure. An incubation period of 1-2 weeks was chosen by a majority of 85 (62.5%) of the respondents. Aggression was described as the major sign of rabies by 112 (82.4%) of the respondents. Seventy (51.5%) of the respondents had encountered dog bites. In line with this, the same percentage practiced thorough washing of the bite wound with soap and water as a first management practice. The need to immediately follow the full course of vaccination after exposure was considered by less than half of the respondents, 60 (44.1%). The Ministry of Health and the Ministry of Agriculture should work hand in hand with all relevant stakeholders to ensure the smooth delivery of health services especially concerning post-exposure treatments and care while entreating people at high risk such as (veterinarians) to take pre-exposure prophylaxis.

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1. Introduction

Rabies is a severe and progressive zoonotic neurological disease caused by the rabies virus (RV), a member of the Lyssavirus genus (in the family Rhabdoviridae of the order Mononegavirales) that affects all warm-blooded animals and is primarily spread through bites from rabid animals [1]. With a case fatality rate of almost 100% and the ability to be transmitted from animals to humans, rabies is a lethal and serious public health risk [2]. Although all mammalian species are susceptible to the virus, unvaccinated domesticated canines are the most common human source of rabies [3]. Preventing rabies in dogs is the top priority for human rabies prevention as they are responsible for over 99% of all human cases [4].

According to [5], between 1970 and 1974, an average of 72 cases of canine rabies were reported per year in Ghana. Also, between 1977 and 1981, this number climbed to more than 100 instances every year, with the number of human rabies cases increasing to 27 in 1981. In addition, between 1986 and 2003, 144 people died in Ghana as a result of rabies transmitted by dog bites [6]. A total of 123 clinically diagnosed rabies cases were documented from 2000 to 2004 [7]. The number of rabies deaths in the nation decreased significantly between January 2009 and July 2011 due to the 25 rabies cases brought on by dog bites that were reported [7]. However, by 2016, 64 human rabies cases were reported, and rabies cases had resumed their upward trend as a result of inconsistent rabies prevention plans and corresponding rabies preventative measures [7]. Even though Ghana vaccinated 120, 933 dogs against rabies in 2011, the overall number of dogs in that year was unknown [6].

In the Brong Ahafo Region, 546 dog bite victims between 2009 and 2012 were reported, of whom 295 (54%) were under 15 years old, 169 (31%) were in the 15–59 age range, and 82 (13%) were above 60. Of the total number of dog bite victims, 300 (55%) were men and 246 (45%) were women. Also, 411 (75%) of the affected canines had their rabies tested, and 54 (13%) of them tested positive [8].

There have been reports about the situation in the Greater Accra Region, Manya Krobo in the Eastern Region, Techiman in the Brong-Ahafo Region, and Ghana as a whole [9]. However, there are reports on this situation in the newly created Bono Region which was curved out from the Brong-Ahafo region, hence the need for this assessment. This study therefore seeks to assess dog owners' knowledge, attitudes, and practices on canine rabies in the Sunyani Municipality of Ghana.

2. Methodology

2.1. Study area and population

The research was carried out in the Sunyani Municipality in the Bono Region of Ghana. Sunyani Municipality is the administrative capital of Ghana's Bono Region. It is located between Latitudes 7°20′N and 7° 05′N and Longitudes 2° 30′W and 2° 10′W, [10] with a population of 147,982 people (Ghana Statistical Service, 2021: [11].

2.2. Sampling size and Sampling technique

The Cochran formula was used

$n = \frac{z^2 p(1-p)}{e^2}$, where n is the sample size

p is the prevalence (0.5), z is the 1.96 at 0.5 confidence level

e is the allowable error = 0.05 but (0.08) was used

$n= \frac{(1.96)^2 * 0.5(1-0.5)}{(0.08)^2} = 150.0625 \;\; n \approx 150$

Snowball sampling was used to access the participants for this study.

Table 1. Selected areas

Name of community	Sample size	Category
Baakoniaba	50	Peri-urban
Fiapre	50	Peri-urban
Penkwasi	50	Peri-urban
Total	**150**	

2.3. Data Collection Procedure

The student information form was used to collect the participants' characteristics. The original questionnaire was developed by [17] and, consists of 25 items and four subscales. The questionnaire is in the 6-point Likert style (1= Strongly Disagree; 6=Strongly Agree). The Cronbach α of the original questionnaire was determined to be 0.92 [14].

2.4. Data Analysis

The questionnaires were coded and entered in SPSS version 16.0 for the analysis. The results were presented in summary tables and graphs. Data presented as categorical proportions were compared by the chi-square (X^2) test. Significant differences between proportions were set at 0.05.

3. Results

3.1. Demographic characteristics of respondents

The socio-demographic characteristics of the respondents are shown in Table 2 below. Among the one hundred and fifty respondents, the majority of the respondents 94 (62.7%) were males with their age group range 20-40 years representing (60.7%). The highest level of education reported by the respondents was tertiary, accounting for 50.7% of the total. All responses showed significant association with the study outcomes based on P-value.

Table 2. Socio-demographic characteristics of respondents

Variable	Frequency	Percentage	X^2	Df	P-value
Age			**113.8**	**3**	**<0.001**
13-19 years	12	8.0			
20-40	91	60.7			
41-59	37	24.7			
At least 60	10	6.7			
Sex			**9.6**	**1**	**0.002**
Male	94	62.7			
Female	56	37.3			
Religion			**127.5**	**2**	**<0.001**
Christianity	113	75.3			
Islam	33	22			
Traditionalist	4	2.7			
Educational level			**113**	**4**	**<0.001**
Primary	3	2.0			
Middle school/JHS	40	26.7			
SHS	19	12.7			
Tertiary	76	50.7			
None	12	8.0			
Marital status			**61.9**	**2**	**<0.001**
Married	56	37.3			
Single	86	57.7			
Divorced	8	5.3			

3.2. Knowledge of respondents on rabies

From Table 3, the majority of the dog owners 136 (90.7%) were aware of rabies infection with 124 of the respondents (91.2%) knowing that the bite of a rabid dog 89% (89.9%) is the major cause of rabies among humans. The domestic dog was identified as the major source of rabies transmission.

Table 2. Knowledge of respondents on rabies

Variable	Frequency	Percentage	X^2	Df	P-value
Aware of rabies			99.2	1	<0.001
Yes	136	90.7			
No	14	9.3			
Rabies is infectious			62.2	1	<0.001
Yes	114	83.8			
No	22	16.2			
Rabies is preventable			89	1	<0.001
Yes	123	90.4			
No	13	9.6			
Mode of transmission					
Bite of a rabid dog			92.2	1	<0.001
Yes	124	91.2			
No	12	8.8			
Scratch			11.8	1	0.001
Yes	48	35.5			
No	88	64.7			
Contact with infected secretions			8.5	1	0.004
Yes	51	37.5			
No	85	56.7			
Touching a dog			116.7	1	<0.001
Yes	5	3.7			
No	131	96.3			

Table 3. Knowledge of respondents cont'

Sign of rabies						
Aggressiveness			6.9	1		<0.001
Yes	112	82.4				
No	24	17.6				
Profuse salivation			0.1	1		0.732
Yes	70	51.5				
No	66	48.5				
Vomiting			73.5			
Yes	18	13.2		1		<0.001
No	118	86.8				
Indiscriminate barking			0	1		0.864
Yes	69	50.7				
No	67	49.3				
Hydrophobia			16.9	1		<0.001
Yes	92	67.6				
No	44	32.4				
Incubation period			62.7	2		<0.001
1-2weeks	85	62.5				
1-3months	41	30.1				
1 year	10	7.4				

Transmitters Of rabies						
Dog			109.4	1		<0.001
Yes	129	94.9				
No	7	5.1				
Cat			1.9	1		0.17
Yes	76	55.9				
No	60	44.1				
Wildlife			7.5	1		0.006
Yes	52	38.2				
No	84	61.8				
Fowl			132	1		<0.001
Yes	1	0.7				
No	135	99.3				

From Figure 1, dog bites were recognized as the major mode of rabies transmission followed by contact with infected secretions.

Aggressiveness was identified as the observed sign of rabies followed by hydrophobia and with the least being vomiting Figure 2.

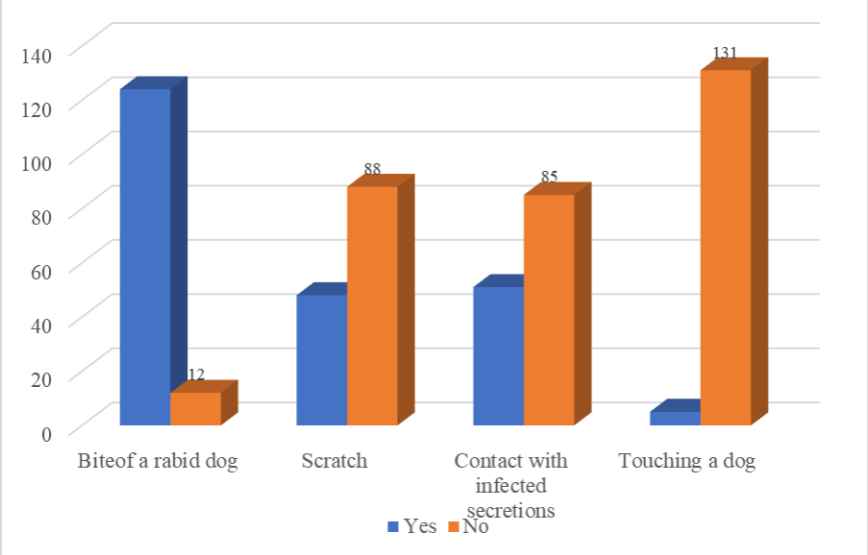

Figure 1. Figure 2. Mode of transmission of rabies

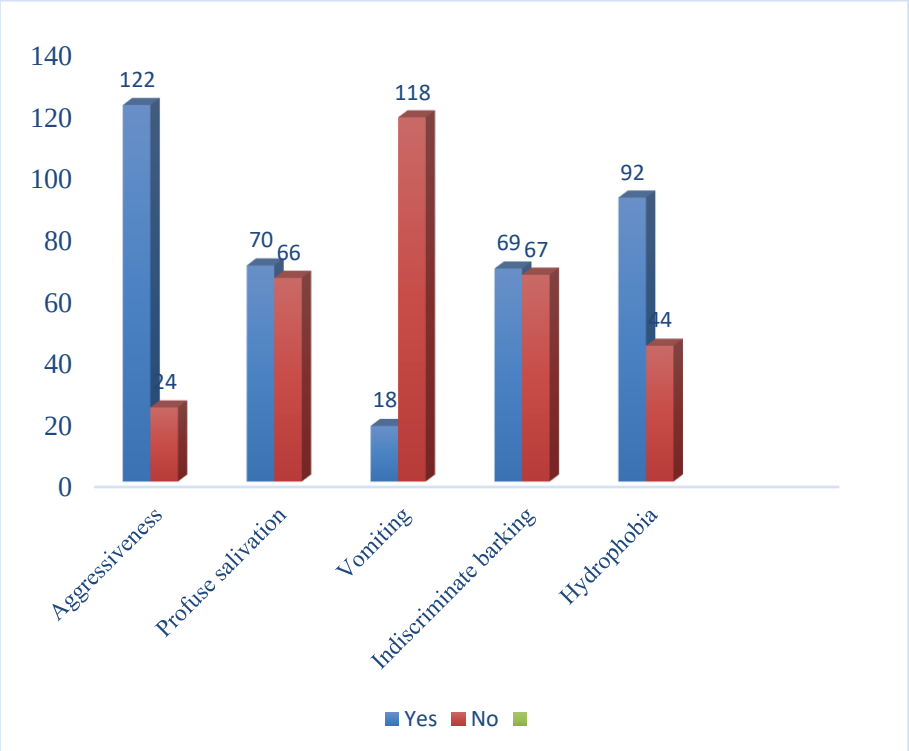

Figure 3. Signs of rabies

3.3. Attitude of respondents towards rabies

From Table 4, the majority of the respondents (93.4%) stated that rabies is a risk to human health and the same number agreed that it is important to vaccinate dogs against rabies with 119 (87.5%) attesting to the fact that it is vital to eliminate the fatal disease. The number of respondents who had vaccinated their dogs before was 96 (70.6%), and 40 (29.4%) of the respondents had not vaccinated their dogs before (Figure 3) with their main reason being that rabies vaccines are expensive. Most of the dog owners strongly agreed to complete when a person is bitten by a suspected dog.

Table 4. The attitude of respondents toward rabies

Variable	Frequency	Percentage	X^2	Df	P-value
Rabies is a risk to humans			102.4	1	<0.001
TRUE	127	93.4			
FALSE	9	6.6			
Eliminating it is vital			76.5	1	<0.001
TRUE	119	87.5			
FALSE	17	12.5			
It is important to vaccinate dogs			102.4	1	<0.001
TRUE	127	93.4			
FALSE	9	6.6			
Have vaccinated dog			23.1	1	<0.001
Yes	96	70.6			
No	40	29.4			
If no why-Vaccine not accessible			102.4	1	<0.001
Yes	9	6.6			
No	127	93.4			
Vaccine is expensive			65	1	<0.001
Yes	21	15.4			
No	115	84.6			
Vaccine not efficacious			116.7	1	<0.001
Yes	5	3.7			
No	131	96.3			
Complete full courses of vaccination when bitten by a suspected rabid dog			166.7	3	<0.001
Strongly agree	98	72.1			
Agree	24	17.6			
Neutral	7	5.5			
Disagree	7	5.5			

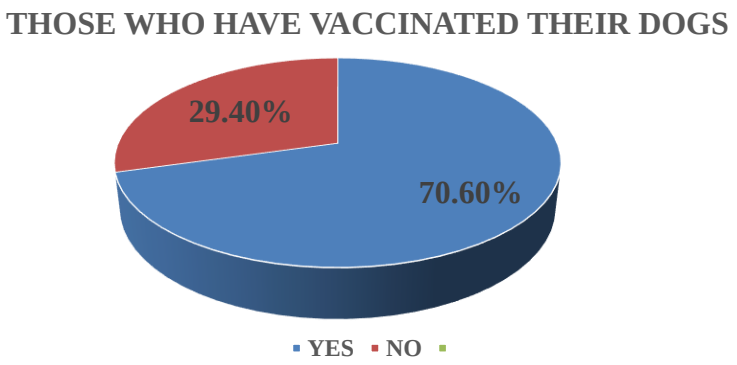

Figure 4. Vaccination of dogs

3.4. Practices of respondents towards rabies

For Table 6 below, 60 respondents (44.1%) stated that they always follow the vaccination schedule, 20 (14.7%) said they often follow,30 (22.1%) stated that they sometimes follow the vaccination schedule and 26 (19.1%) never follow the vaccination schedule.

Table 5: Practices of respondents on rabies

Variable	Frequency	Percentage	X^2	Df		P-value
Able to follow the vaccination schedule			28	3		<0.001
Always	60	44.1				
Often	20	14.7				
Sometimes	30	22.1				
Never	26	19.1				
Encounter dog bite			0.1	1		0.732
Yes	70	51.5				
No	66	48				
First thing you would do when bitten by a suspected rabid dog			72.4	3		<0.001
Report to veterinarians	44	32.4				
Wash wound with water and soap	70	51.5				
Take tetanus injection	13	9.6				
Put herbs on the wound	9	6.6				
What you would do when you see a suspected rabid dog			72.4	2		<0.001
Report to veterinarians	90	66.2				
Kill it	85	25.7				
Let it go	11	8.1				

The first management practices when bitten by a suspected rabid dog

Washing the wound with water and soap was the most considered option about the first management practice to consider when bitten by a suspected rabid dog with 70 (51.5%) respondents. Reporting to veterinarians was stated by 44 (32.4%) of the respondents. Thirteen (9.6%) of the respondents opted to take tetanus injections and nine (6.6%) of the respondents chose to put herbs on the wound.

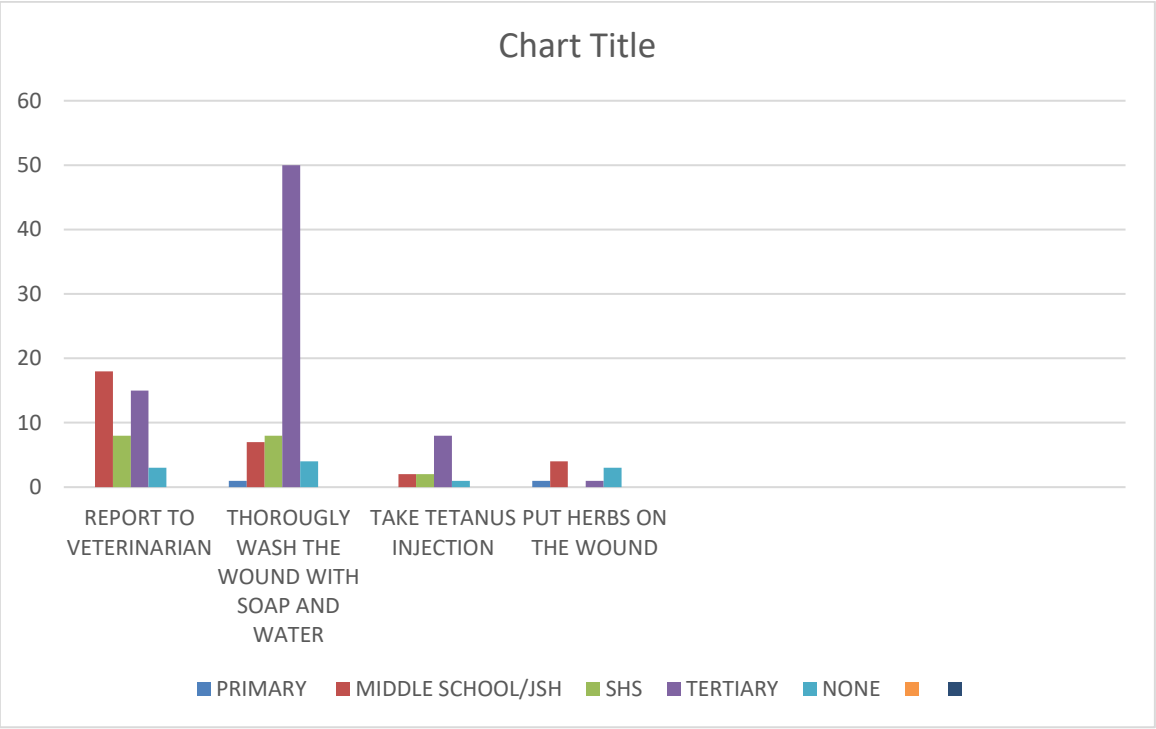

Figure 5. The first management practice to consider when bitten by a suspected rabid dog

4. Discussions

4.1. Knowledge of respondents on rabies

The findings of this study show that 90.7% of the respondents had heard of rabies. This report is in line with [4] and [17] who reported 92.0% and 90.7% of respondents were aware of rabies respectively. The high level of awareness of rabies in the Sunyani Municipality could be due to the high incidence of dog bite cases and some deaths as a result of rabies. The majority of the inhabitants are in constant contact with dogs as they rely on them for security as they almost all the time are not home but leave their daily endeavors. On the contrary, the situation is different according to [12] who reported a lower percentage of 38.2% of respondents who were aware of rabies in Nigeria. This difference could be due to differences in the incidence of rabies in different areas and levels of awareness programs.

In this study, 92.9% of respondents stated that rabies is mainly caused by the bite of a rabid dog. Rabies has posed a hazard to humans for millennia, with descriptions in ancient texts from the Mediterranean Basin to India linking human sickness to contact with diseased dogs by [13]. This was higher when compared to a study conducted by [12] in Nigeria which recorded 56.0%. This difference is probably due to the level of rabies incidence in different areas. On the signs of rabies,

82.4% of respondents stated aggressiveness as a sign of rabies. This was higher when compared to a report by [9] with 63.5%. The difference could be due to the level of awareness and exposure of respondents to infected suspected rabid dogs and literature. The situation was different in a study by [18] who recorded a lower percentage of 40 on aggressiveness as a sign of rabies with a sample size of 55. The difference could be possibly due to the difference in sample size.

The study revealed that the level of education influenced the knowledge of the pathognomonic sign of rabies which is hydrophobia. Out of 92(100%) respondents for hydrophobia,59.8% were in tertiary. This could be due to the reason that disease is being taught in schools and the ability of students to access information on the internet in relation to rabies.

4.2. Attitude of respondents on rabies

Ninety-three-point four percent (93.4%) of the respondents believe that it is important to vaccinate dogs. This is higher when compared with a study conducted in China by [15] who reported 54.07% of the respondents strongly agreed to the vaccination of dogs as a way to control rabies occurrence. This difference could probably be due to level of knowledge on the need to vaccinate dogs as a preventive measure against rabies. Managing canine rabies rather than expanding prophylaxis for human control is the most cost-effective method to eliminate the global burden of human rabies [2]. The percentage of respondents who had their dogs vaccinated was 70.6%. This is encouraging because it conforms to the global campaign efforts to achieve at least 70% vaccination coverage among susceptible dog populations every year until elimination is accomplished [14]. [7] reported that, 52.7% out of 76.5% of respondents who knew of rabies vaccinated their dogs. This means that,, respondents' good rabies knowledge did not convert into the implementation of optimal disease prevention strategies [7]**.** The difference could be due to a high level of knowledge about rabies, the ability to afford vaccines and veterinary services a high sense of responsibility of dog owners towards their dogs, and the need for a collaborative effort to control the disease in the Sunyani Municipality. On the issue of completing all the courses of vaccination when bitten by a suspected rabid dog, 72.1% of respondents strongly agreed. This is slightly higher than a report according to [15] in China, with 60.89% of respondents who strongly agreed. This slight difference could be due to the level of knowledge on the importance of human anti-rabies vaccination as well as the ability to afford it. Human vaccination after exposure to suspected rabid animals (post-exposure prophylaxis), is also successful, although it is more expensive than dog vaccination and necessitates close monitoring and integration of animal and human healthcare systems [14].

4.3. Practices of dog owners towards rabies

The study revealed that 44.1% of respondents always follow the vaccination schedule. This value is low when compared to a report by [15] who reported 83.84% of respondents who always follow the vaccination schedule. This vast difference could be as a result of inconsistent vaccination campaigns and reminder programs in the Sunyani Municipality. Majority of dog owners tend rash to the veterinary clinic or engage the services of veterinarians only when there is alarming cases of dog bites and rabies related deaths. Dog rabies vaccination campaigns may be hampered due to a variety of factors such as a lack of finance, political instability, or natural disaster [14].

Regarding the first management to consider when bitten by a suspected rabid dog, 51.5% of respondents stated that they will wash the wound with detergent. Although [9] reported only 25.2%

of respondents who chose thorough wound washing. This variation could be due to the level of education as this report reveals that 71.4% of respondents to this variable are those in the tertiary category. All people who have been exposed to rabies should begin by properly cleansing and cleaning the wound with soap and water or a virucidal substance. This should be done right away [16].

5. Conclusion and Recommendation

5.1. Conclusion

This study has shown that the level of knowledge, attitude, and practices of dog owners on rabies in the Sunyani Municipality has been generally good. Despite this, there have been few knowledge gaps in almost every aspect of this study, especially about the first practices to consider after exposure and their adherence to post-exposure prophylaxis.

5.2. Recommendation

Public education and periodic awareness campaigns should be instituted to increase the people's knowledge of rabies which would positively impact the attitude and practices towards rabies disease control in Ghana.

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