



Awareness and management practices against rabies among dog owners in livestock farming communities, Plateau State: A preliminary report

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Abstract

Rabies remains a significant public health concern, especially in endemic regions like Africa and Asia, with likely underreported cases. Primarily transmitted through dog bites, rabies poses a substantial risk in Nigeria, where dogs are the main carriers. This study investigated rabies awareness and control practices among dog owners in livestock farming communities in Plateau State, Nigeria. This was done using structured questionnaire interviews with 50 respondents from five Local Government Areas. Data analysis revealed that 78% were aware of rabies, but few recognized its severity. Only 46% knew about rabies vaccination, and merely 16% sought clinical assistance post-dog bite. Despite relatively high awareness, gaps exist in understanding susceptible hosts, proper management, prevention, and health-seeking behaviours. Findings underscore the necessity of bolstering awareness and management, including vaccinations, to encourage effective rabies control measures among vulnerable populations within remote communities and nationwide.

Keywords: Awareness, Dog Owners, Livestock, Management practices, Plateau state, Rabies

Introduction

Rabies is a highly fatal viral disease of public health significance. The disease claims an estimated 59,000 people annually despite the presence of a rabies vaccine (Hampson *et al.*, 2015; CDC, 2020). Most of these deaths are recorded in Asia (59.6%) and Africa (36.4%) where the disease is still very noticeable, especially among low-income people and children (WHO, 2018). The disease is caused by a highly neurotropic single-stranded, negative-sense RNA virus belonging to the genus *Lyssavirus* family *Rhabdoviridae* (WHO, 2018). Although rabies is 100% preventable, and effective control measures are

available, the number of deaths is still high, especially in Asia and sub-Saharan Africa, with more than 3.3 billion people at risk (Hampson *et al.*, 2015; Deviatkin & Lukashev, 2018).

The first case of rabies was reported in Nigeria in 1912 (Boulger & Hardy, 1960). Nigeria has a large dog population, estimated to be around 2 million (Luga *et al.*, 2018). However, a significant portion of these dogs are unvaccinated and not properly managed, leading to a higher risk of rabies transmission. Stray dogs and free-roaming domestic dogs contribute to the spread of rabies within communities.

Despite efforts to control rabies, such as vaccinations and awareness of post-exposure prophylaxis in humans (PEP) in Nigeria, the disease continues to be a major challenge for dogs and cats in Nigeria. Reports on human death due to rabies infection in Nigeria are low because of under-reporting, cultural beliefs, inadequate rabies diagnostic units, and poor knowledge of the mode of transmission and prevention of the disease (Eke *et al.*, 2015). This has made the disease being ignored by relevant healthcare facilities and subsequently poor assistance from the government, international community, and donor agencies. Routine vaccination of dogs against rabies in most African countries is also low (Eke *et al.*, 2015).

There has been a paucity of studies undertaken in these communities to investigate rabies-related behaviours and management practices. However, community competence in detecting and managing rabies cases, as well as an understanding of behaviours that promote disease transmission, is a critical step in guiding control strategies against diseases of public health concern such as rabies. Therefore, this study aimed to assess the awareness and management practices of dog owners against rabies.

Materials and Methods

Study design, area, and population

A cross-sectional study was carried out in livestock farming communities in Plateau State, North-Central Nigeria. Our selection criteria were based on those farmers who are known to own and rear cattle, sheep, goats, poultry, and dogs together. The Berom, Tarok, and Fulani communities were identified as the key communities that raise these livestock and dogs. Five local government areas (LGAs) where the targeted farmers are domicile were chosen (Barkin Ladi, Bokkos, Jos South, Langtang North, and Mangu) (Figure 1).

Selection of farmers for the study

Preliminary engagement with community leaders and stakeholders in targeted communities across the five LGAs to inform them about the study and its public health importance was conducted. We explained to them why the communities were chosen and why we needed them to disseminate this information to the farmers who are also dog owners, raising these animals in their various locations. Furthermore, the stakeholders helped in reaching out to the respondents, and the list of consented individuals was obtained, which included both male and female farmers. A total of

63 willing farmers were sent to us. However, because of the discrepancies in the number of farmers in each LGA (Barkin Ladi- 12, Mangu- 13, Bokkos- 10, Jos South, and Langtang North-13). Ten farmers were used as a benchmark across the five farmers in each LGA (Barkin Ladi- 12, Mangu- 13, Bokkos- 10, Jos South, and Langtang North-13). Ten farmers were used as a benchmark across the five LGAs to randomly select a total of 50 farmers from the sample frame of 63 farmers.

All selected 50 farmers gave verbal consent as a prerequisite to participate in this study. The structured questionnaire was administered as a one-on-one interview with the farmers.

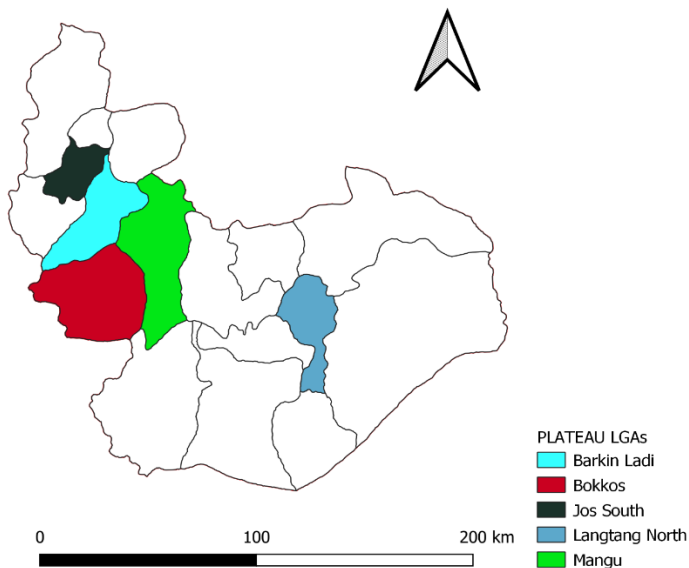


Figure 1: Map of Plateau state showing the study area

Table 1: Percentage of farmers' awareness about Rabies in the study area

Variables	Yes (%)	No (%)
How many farmers are aware of rabies as a disease of dogs?	39(78)	11(22)
How many claim rabies is a fatal disease?	37(74)	13(26)
How many of the farmers were able to list two clinical signs of rabies?	33(66)	17(34)
How many farmers claim they have seen signs of canine rabies in other animals?	6(12)	44(88)
How many farmers know the animals transmitting rabies?	15(30)	35(70)

Table 2: Percentage showing management measures adopted by farmers for animals and humans

Variables	Yes (%)	No (%)
How many of the farmers have sought help to manage rabies cases in the past?	8(16)	42(84)
How many of the farmers claim to know about the rabies vaccine?	23(46)	27(54)
How many farmers claim rabies is treatable?	15(30)	35(70)
How many of the farmers have in the past vaccinated their dogs?	23(46)	27(54)
How many farmers claimed that the human victims of dog bites went to the health center for repeated post-dog-bite injections?	20(40)	80(60)
How many of the farmers believe that the rabies vaccine is affordable?	11(22)	39(78)

Data analysis

Data were entered, cleaned, and analysed descriptively using Microsoft® Excel 10 spreadsheets. The results obtained were expressed in tables as Percentages.

Results and Discussion

A total of 50 respondents were interviewed in the survey, most respondents were males 35(70%) while 15(30%) were females. All participants (100%) owned livestock and dogs and were within the age group of 20 – 66 years. The study aimed to assess rabies awareness and management practices among dog owners in selected LGAs of Plateau State (that met the selection criteria of keeping livestock and dogs). The outcome of this was to identify gaps that improved vaccinations and management practices will serve as sustainable targeted interventions to control rabies in domestic and livestock, reared by the farmers. Findings revealed that 78% of respondents were aware of canine rabies, understood its fatal nature (74%), and recognized common clinical signs (66%) like salivation and aggressiveness (Table 1). This aligns with previous studies (Hambolu *et al.*, 2014; Mutembei *et al.*, 2015) that reported similar high awareness levels (88.6% and 86%, respectively). However, limited knowledge existed regarding animal-to-animal transmission of rabies, such as from rabid dogs or bats to livestock. This study revealed that a few respondents (12%) had observed rabies symptoms in their sheep, likely due to their experience raising dogs and livestock over time (Table 1). These results underscore the need for targeted public education, especially on susceptible populations, transmission routes and preventive measures, to enhance rabies control measures in these communities. This need is evidenced by the report of Mshelbwala *et al.* (2021), where awareness was higher due to sustained educational levels in the communities.

This present study also highlights key findings regarding rabies management practices among farmers. Only a small percentage (16%) sought help

after dog bites for rabies management, indicating a lack of awareness about the danger of the virus (Table 2). This contrasts with a study by Glasgow *et al.* (2019), which reported a higher rate of 75% seeking help following bite in Grenada. The absence of health education programs and proper awareness in these communities likely contributes to this disparity, emphasizing the need for comprehensive educational efforts covering vaccinations and management practices. Although approximately 46% were aware of rabies vaccination, the perceived lack of affordability (78%) hampers its uptake (Table 2). Limited access to veterinary services might influence this perception, underscoring the need for trained community animal health workers to facilitate timely intervention and advice. Respondents' adherence to WHO guidelines for rabies treatment indicates a potential for standardized protocols.

Awareness about rabies and its implications for public health remains limited, as evident from low health centre visits after dog bites (40%). Educational levels are linked to effective rabies treatment and control, aligning with previous studies (Dzikwi *et al.*, 2012). This study's significance lies in its unique focus on communities rearing livestock with dogs, identifying gaps in management practices and potential areas for improvement, particularly through educational campaigns and targeted interventions. Communities' willingness to support rabies control programs underscores their receptiveness to enhancing disease management capacities.

In conclusion, this study unveiled that farmers co-keeping dogs and livestock are aware of rabies, identifying clinical signs like aggressiveness and salivation in rabid dogs. However, their understanding of susceptible populations, rabies management and control, including vaccinations, was limited. Again, this underscores the need for robust health education programs, affordable vaccinations, and improved access to veterinary services to enhance rabies management practices. Furthermore, understanding rabies awareness and control practices among livestock farming communities

offers valuable insights for future public health initiatives and policies in addressing rabies incidence. Our present work has limitations regarding sample size due mainly to accessibility and security constraints. However, this study has provided insight into the level of awareness of rabies management practices, risks, and the importance of sustained public education and vaccination campaigns against rabies in livestock farming communities. We, therefore, recommend that more research be undertaken with a larger sample size to obtain more precise results.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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