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Original Research Article

Influence of grooms' knowledge and practices on horse diseases in Kano metropolis, Kano State, Nigeria

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ABSTRACT

The study aimed at determining the grooms' knowledge and practices on horse diseases in Kano Metropolis, Nigeria. The Zonal Veterinary Officers (ZVO) and Area Veterinary Officers (AVO) served as facilitators (informants) during the study. The ZVOs or AVOs identified the grooms for participation and selected the meeting points for interaction with them. During the study, the AVO/ZVO introduced the study to the grooms and requested for their cooperation. Three teams made up of ceremonial, polo and racing horses were constituted and semi structured interview was used in the study. The study revealed that the grooms knew horse diseases and even given them vernacular names. They could recognize 16 diseases of horses to the extent that they gave their estimated rates of occurrences. These include ulcerative lymphangitis (UL), (Rank=2; Z=1.73), colic (Rank =1; Z=2.55), piroplasmosis (P) (R=3; Z=0.75), mange (R=5; Z = 0.08), African horse sickness (AHS) (R=6; Z=0.00) and azoturia (R =8; Z= -0.44). They can relate certain symptoms with particular diseases such as: Recumbence and restlessness as suggestive of colic: Lameness, swollen elbow and fistulous withers as suggestive of brucellosis and lameness and nodules as suggestive of ulcerative lymphangitis (UL). Six (6) abnormal management practices that may predispose to diseases were identified: Inadequate feeds, shelter (improper housing), mixing of horses (from different locations especially during events) and high cost of medication. They reported self-treatment of their horses as a result of inadequacy of veterinary services. From the study, it could be concluded that horse diseases commonly encountered by grooms in the study area in order of importance were colic, ulcerative lymphangitis, piroplasmosis and mange.

. **Keywords:** Epidemiology, Grooms` Knowledge, husbandry practices, horse diseases, incidences.

INTRODUCTION

Horse keeping in Nigeria has been long and can be said to be as long as domestication of horses has been in Africa (Mshelia, 2013). These horses are used for Polo, racing, ceremonial, police, army, leisure, sugar cane production and that pastoralists used horses for hauling their goods and transporting their young ones during the annual transhumance from the North to the South of the country (Saidu *et. al*., 1991; Mshelia, 2013; Musa, 2013; Baba, 2016). In the process of using these horses, the owners derive a lot of economic gains, especially those that use them for polo and racing (Baba, 2016). Recently, Nigerians have developed a culture of leisure horse riding at weekends where people hire horses for leisure as well as for horse riding during marriage ceremonies (Baba, 2016). The use of local horses for sugar cane juice extraction has found good spot in some states of Nigeria, with a lot of economic gains being derived from doing so (Musa, 2013).

However, diseases such as piroplasmosis, colic, brucellosis, ulcerative lymphangitis, epizootic lymphangitis and helminthosis have been variously reported to infect horses in Nigeria (Garba, 2006; Mshelia, 2013; Musa, 2013; Baba, 2016; Edeh, 2018).

The husbandry and management practices, as carried out by horse owners and pastoralists in most cases prone them to

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diseases. For example, Edeh (2018) in Kaduna State, Nigeria reported that some horses, especially those under ceremonial management could be faced with colic due to inadequate feeds for provision of dry grasses without adequate water.

The horse in Kaduna State, Nigeria were similarly reported to be grazed along with small ruminants during periods of none engagement with tournaments (Baba, 2016).

To what extent the horse owners and grooms in Kano Metropolis know diseases of horse along with their practices to manage these diseases are the primary objectives of this study. The study was therefore conducted through the use of purposeful sampling techniques and employing participatory epidemiological tools in four Local Government Areas (LGAs) out of the seven LGAs of the Kano Metropolis of Kano State, Nigeria. The study was also undertaken in view of the contribution of horses in Nigeria in many ways that include durbar, racing, polo and sugar cane production, particularly that some of these diseases could be zoonotic.

MATERIALS AND METHODS

The study area was Kano Metropolis, Kano State, Nigeria which is situated between latitude 13^0N and 11^0N and between longitude 8^0W and 10^0E (Fig.1). Kano State is one of the 36 states and the Federal Capital Territory in Nigeria. It has a human population of 9,383,682 (NPC, 2006). It is also a commercial hub with a lot of racing and polo activities. The domestic equine population in Nigeria is made up of 340, 000 horses and 940, 000 donkeys of which 2, 500 horses are in Kano State (RIM, 1992; Musa, 2013).

The locations for the study were selected based on purposeful sampling, convenience and willingness of the horse owners and grooms to participate in the study. Thus, four Local Government Areas (LGAs) out of the seven LGAs that made up the Kano Metropolis were selected for participation in the study. This selection was based on the realization of the desire to capture ceremonial, polo and racing horses as doing this gave ample opportunities to understand more holistically the horse owners and their grooms understanding of diseases of horses.

At the LGA level horse grooms were identified through the Kano State Department of Veterinary Services as this Department had good working relationship with horse owners and their grooms through routine Veterinary activities. Furthermore, the Zonal Veterinary Officers (ZVO) and Area Veterinary Officers (AVO) under the State Veterinary Services served as informants and facilitators during the study.

At each LGA, the ZVOs or AVOs identified the grooms for participation in the study as well as in the selection of the meeting points for interaction with the grooms. During the study proper, the AVO/ZVO introduced the subject of the study to the horse owners and requested for their cooperation to participate fully in the study. They were also requested to give honest information during the study. This paved the way for the identification of horse grooms from the stables

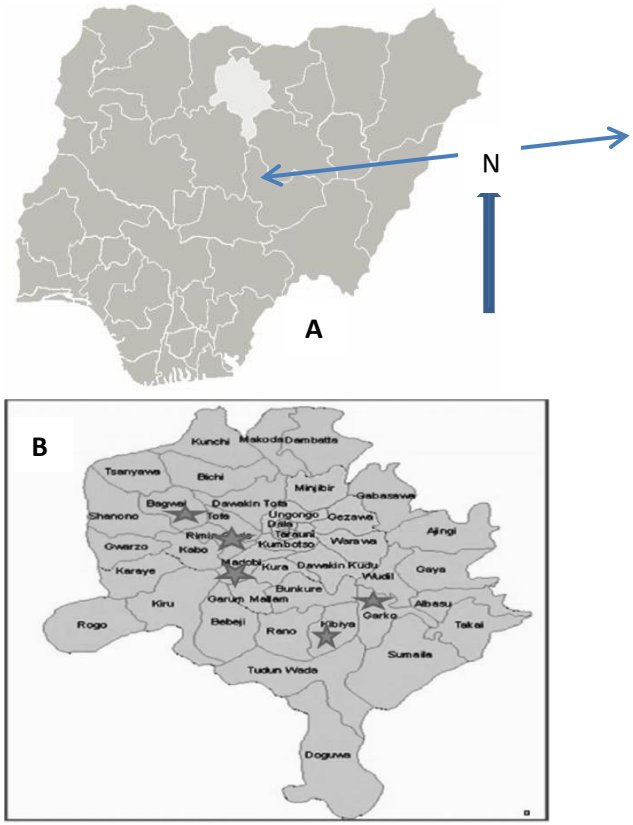

Fig. 1: Map of Nigeria (A) showing Kano State (shaded grey and in B)

within each LGA for participation in the study. Three teams made up each of ceremonial (Gidan Sarki Stables, Kano Municipal Council Area), polo (Polo ground Nasarawa LGA) and racing (Race Course, Tarauni LGA) were constituted for participation in the study to enable us receive information on the grooms' knowledge, and practices with regard to horse diseases in the study areas.

During interaction with the teams, Participatory Epidemiology (PE) tools were used to retrieve information from the grooms using the methods of Kaltungo (2018a) and Buhari (2019). The PE tools used in the study included semi-structured interviews (SSI), scoring and ranking, proportional piling, matrix scoring and transect walk as advanced by (Catley, 2005).

RESULTS

GROOMS' KNOWLEDGE ON HORSE DISEASES

The SSI was used in determining the grooms' Veterinary knowledge and to determine the presence of horse diseases among horses in Kano Metropolis. The study revealed that the grooms knew horse diseases by even giving them local

Table I: Diseases identified by grooms in Kano Metropolis, Kano State, Nigeria and rates of their occurrence

Diseases	Disease local name	Mean (%)	Median (%)	Range	Z-Score	Rank
Colic	Ciwon ciki	17.33	15	11	2.55	1
Ulcerative Lymphangitis	Kyambi	13.67	13	4	1.73	2
Piroplasmosis	Zazzabi	9.33	10	4	075	3
Thrush	Alapa	8.00	6	8	0.45	4
Mange	Dasusu	6.33	7	4	0.08	5
African horse sickness	Ciwon iska	6.00	7	11	0.00	6
Helminthosis	Hanta	6.00	5	3	0.00	6
Equine influenza	Tari	5.33	5	3	-0.15	7
Tetanus	Rankwi	5.33	4	6	-0.15	7
Bran disease	Kumarmari	4.00	5	7	-.044	8
Azoturia	Tija	4.00	3	5	-0.44	8
Brucellosis	Bakkale	3.67	4	7	-0.52	9
Tendon/ligament tear	Tenda	3.67	5	6	-0.52	9
Squamous cell carcinoma	Kansa	1.33	0	4	-1.04	10
Ankyloses	Karshi	1.00	0	3	-1.12	11
Rectal prolapse	Basur	0.67	0	2	-1.19	12

Kruskal Walli's statistics H = 1.713; df = 15; p =0.4246

vernacular names (Table I). They could recognize 16 diseases of horses to the extent that they gave their estimated rates of occurrences (Table I). These diseases included ulcerative lymphangitis, (Rank =2; Z=1.73), colic (Rank = 1; Z = 2.55), piroplasmosis (R =3; Z =0.75), mange (R =5; Z = 0.08), African Horse Sickness (R =6; Z = 0.00) and azoturia (R =8; Z =-0.44) among others (Table I).

They were also able to relate certain clinical signs with particular diseases. For example, they associated signs like recumbency {14(8 -20)}, restlessness (12.5 (10-15)}, fever {3(2-4)} and anoraexia {4(3-5)} to colic. They similarly associated fever {3(2-4)}, lameness (14.5 (3-26)}, swollen elbow {2.5(0-5)} and exudates at the withers {10 (0-20)} with brucellosis while they ascribed signs like fever {3.5(2-5)}, lameness {4(3-5)}, nodules along limbs {14(8-20)}, anoraexia {1.5(0-3)} and emaciation {4(2-6)} to ulcerative lymphangitis (Tables IIa and IIb, Figures I, II).

Transect walk enabled the researchers to further understand the grooms' level of knowledge of animal diseases as they identified a horse they suspected to have squamous cell carcinoma (Plate III) and another horse with swollen elbow they suspected it being due to brucellosis (Plate IV). The study also enabled the researchers to have first hand information on the husbandry and management practices of the grooms. Through the transect walk the researchers saw small ruminants and poultry feeding in horses' concentrate feeding troughs (Plate V). There was also close interaction of the horses with these animals. The horses were also kept close togther within few ranges without regard to stocking density. The transect walk also confirmed the interviewees' ascertion of inadeqaute feeds, shelter and water for the horses in the statbles. The researchers similarly saw some grooms that did not participate in the study grooming their horses. When asked about exchange of grooming tools among themselves they reported doing so, especially, during durbar, Polo and racing tornaments.

Practices on animal production and horse diseases

The grooms identified six (6) husbandry and management practices factors that militated against horse keeping and facilitated disease introduction to stables. These included diseases, inadequate feeds and shelter, mixing of horses, especially during racing, polo and durbar and cost of medication (Table III). They also indicated that, as grooms, they had to keep other livestock as sources of economic up keep. These animals included sheep, goats and poultry (Table IV). The grooms at the Gidan Sarki, Nasarawa LGA indicated horses (21) to be of most economic use followed by sheep (18).

Meat from sheep, goats and poultry from all the study locations and sale of manure from sheep in Kano Municipal Council (12), Nasarawa LGA (18) and Tarauni LGA (8) made significant contribution to their keeping of horses. All the interviewees from all the three locations indicated using poultry manure as source of revenue (Table IV). In all these they indicated that there was no any serious implication of keeping these animals to disease occurrence in their horses.

DISCUSSION

From the study, it was found that grooms in the study area indicated some level of knowledge on diseases of horses and even had local names for these diseases. This could be due to to their long stay with the horses and the fact that some of them might have interacted with veterinarians who might have introduced them to the diseases. It could also be because they might have received some training programmes as the grooms around Zaria, the home of the Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria used to organize training programmes for grooms.

Table IIa: Clinical indicators for selected horse diseases as identified by grooms in Kano Metropolis, Kano State, Nigeria

Clinical indicators (W)	Diseases										
	Colic (Ciwon ciki)+	Brucellosis (Bakkale)+	Ulcerative lymphangitis (Kambi)+	Tetanus (Ranque)+	Equine influenza (Tari)+	African Horse Sicknes (Ciwon iska)+s	Piroplasmosis (Zazzabi)+	Bran disease (Kumarmari)+	Azoturia (Tija)+	Thrush Alapa)+	Tendon tear (Tenda)+
Recumbency (0710*)	14 (8-20)	0 (0-0)	0 (0-0)	2.5 (0-5)		0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	1.5 (0-3)
Restlessness (0.667)*	12.5 (10-15)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Fever (0.757)**	3 (2-4)	3 (2-4)	3.5 (2-5)	1.5 (0-3)	0 (0-0)	17.5 (15-20)	7.5 (3-12)	0 (0-0)	3.5 (0-7)	0.5 (0-1)	1 (0-2)
Coughing (1.000*)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	5.5 (5-6)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Lameness (0.750)**	0 (0-0)	14.5 (3-26)	4 (3-5)	5 (3-7)	9.5 (8-11)	0 (0-0)	0 (0-0)	0 (0-0)	11.5 (0-23)	10 (5-15)	12.5 (0-25)
Foot lesions (1.000*)**	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	10 (0-20)	0 (0-0)
Haemoglubinuria (1.000*)**	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	10 (5-15)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Locked jaw (1.000*)**	0 (0-0)	0 (0-0)	0 (0-0)	12.5 (5-20)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Nodules (1.000*)**	0 (0-0)	0 (0-0)	14 (8-20)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)

Cells showed median scores (range) for clinical signs against a corresponding disease, maximum obtainable score = 30; W = Kendall's coefficient of concordance (*p<0.05; **p<0.01; ***p<0.001)

Another reason for their seeming knowledge of diseases could be the radio and television technology transfer programmes by the National Agricultural Extension Research Liaison Services of the Ahmadu Bello University, Zaria that released weekly programmes to educate crop and livestock farmers on production technologies. The knowledge of these grooms seems to agree with the reports of Kaltungo (2013), Buhari (2014) and Baba (2016) who reported that pastoralists and horse owners and grooms had some ideas on livestock and horse diseases. Earlier, Mijindadi & Saidu (1990), (1991) and Buhari *et al*. (2015) had reported pastoralists` ability to identify livestock diseases and even treat them with local herbs with some level of success. It could also be possible that the grooms knew these diseases through their trainers as Edeh (2018) reported that horse trainers were in a habit of educating grooms and even teach them how to deworm horses. He also reported that grooms were also treating horses with colic using traditional methods.

Table IIb: Clinical indicators for selected horse diseases as identified by grooms in Kano Metropolis, Kano State, Nigeria

Clinical indicators (W)	Diseases										
	Colic (Ciwon ciki)+	Brucellosis (Bakkale)+	Ulcerative lymphangitis (Kambi)+	Tetanus (Ranque)+	Equine influenza (Tari)+	African Horse Sicknes (Ciwon iska)+s	Piroplasmosis (Zazzabi)+	Bran disease (Kumarmari)+	Azoturia (Tija)+	Thrush Alapa)+	Tendon tear (Tenda)+
Icteric MM (0.667)*	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	2 (0-4)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Anoraexia (0.681)*	4 (3-5)	0 (0-0)	1.5 (0-3)	3.5 (2-5)	7.5 (5-10)	4.5 (4-5)	7 (6-8)	0 (0-0)	0 (0-0)	2.5 (0-5)	0 (0-0)
Emaciation (0.286)	0 (0-0)	0 (0-0)	4 (2-6)	0 (0-0)	0 (0-0)	2.5 (0-5)	1 (0-2)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Swollen elbow (0.333)	0 (0-0)	2.5 (0-5)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Regurgitation (0.333)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	12.5 (0-25)	0 (0-0)	0 (0-0)	0 (0-0)
Fistulous withers (0.667)*	0 (0-0)	10 (0-20)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Nasal discharges (0.667)*	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	7.5 (0-15)	7 (4-10)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Foamy salivation (0.246)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	2 (0-4)	7 (6-8)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Stunted growth (0.667)*	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	15 (0-30)	0 (0-0)	0 (0-0)	0 (0-0)

Cells showed median scores (range) for clinical signs against a corresponding disease, maximum obtainable score = 30; W = Kendall's coefficient of concordance (*p<0.05; **p<0.01; ***p<0.001)

Table III: Husbandry problems that affect horse keeping in Kano Metropolis, Kano State, Nigeria

Problems	Mean (%)	Median (%)	Range (%)	Z-Score	Rank
Diseases	0.8	0	3	-1.05	1
Inadequate shelter	1	1	2	-0.3	2
Feeding	0	0	0	-2.1	3
Mixing of horses	3	3	2	2.07	4
Inadequate water	2	2	4	0.79	5
Cost of medication	0.3	0	1	-1,58	6

H= 16.25; df = 5; p = 0.0127; H (Kruskal Walli's statistics)

Figure I: A horse with lesions indicative of mange (arrow) in Yola Gidan Sarki, Kano metropolis, Kano State.

Figure II: Lesions of Ulcerative lymphangitis in hind limb (arrow) of a horse at Polo ground, Nasarawa, Kano State

Figure III: A white horse with) ulcerative lesion in the eyelid indicative of squamous cell carcinoma (arrow) at Tarauni LGA, Kano State

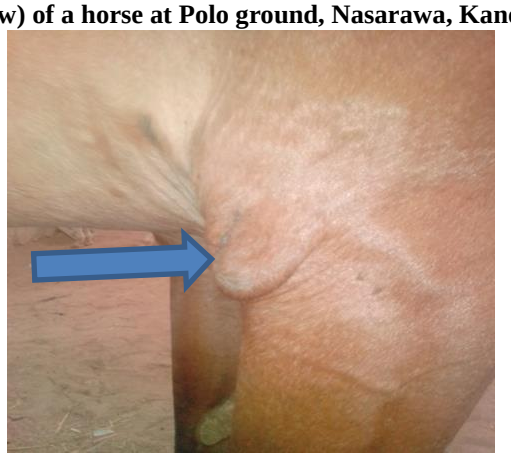

Figure IV: Swollen elbow in the right forelimb (arrow) at Polo ground Nasarawa LGA, Kano State

Figure V: Sheep (A) feeding from the feeding trough of a horse while a chicken (B) scavenging around the horse at Gidan Sarki, Yola Municipal Council, Kano State

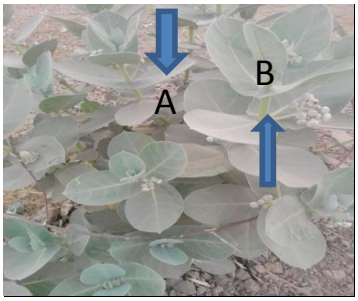

Figure VI: *Calotropes procera plant (A) with milky juice which is used for traditional treatment of brucellosis in Gidan Saeki, Yola Community, Kano State. See fruits (B)*

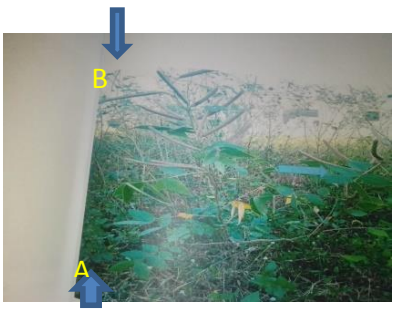

Figure VII: *Senna occidentalis* plant showing the leaf (A and arrow) and seed pod (B arrowed) used for traditional treatment of brucellosis at Polo ground, Nasarawa, Kano State.

With regard to giving names to horse diseases in Nigeria, RIM (1992) indicated that pastoralists, rural dwellers and horse owners recognized some animal diseases and even ascribed names to them. Not only that, pastoralists gave names to their animals (Saidu *et al*., 1991).

From the study, the grooms were able to identify some clinical signs of diseases and even indicated some ability to diagnose diseases. As indicated above, this could be possible through their interaction with veterinarians during polo and racing tournaments as well as during durbar festivals as veterinarians are usually called upon to give helping hand on such occasions. It could also be possible as some states in Nigeria routinely organize training programmes for their personnel and livestock owners. Thus, some of the participants in this study might have benefitted from some of such training programmes. In a study on colic in Kaduna State, Nigeria, Edeh (2018) reported that grooms new signs of colic and were also treating the condition and only called upon veterinarians for help when they failed. The veterinarians who visit their stables for treatment of horses as well as those who give helping hand during tournaments might also have put some of these grooms in the act of recognizing diseases and even treating them. Saidu (2000) reported pastoralists treating their animals themselves and only called upon a veterinarian when they could not achieve real success in their self-medication.

From the study, it was evident that different animal species were interacting among themselves as sheep and poultry were seen feeding on the horses' feeds. This interaction could trigger diseases like brucellosis, should any one of them be infected. Kaltungo (2018b) opined that camels could come down with brucellosis as 7.01% and 10.80% of the camels sampled at Mai'adua and Daura in Katsina State, Nigeria were respectively seropositive for *Brucella melitensis* since the camels in the study area were found closely grazing with small ruminants. In this study, there was the possibility for sheep and even poultry to transmit diseases to these horses as Kaltungo (2013), Kaltungo *et al*., 2013; Buhari (2014) and Yakubu (2016) had earlier reported. They also reported pastoralists hanging aborted foetuses on trees. Similarly, Adesiyun & Abdu (1984), Gugong *et al.* (2012) and Ior *et al*. (2013) were able to demonstrate *Brucella* antibodies in poultry in Nigeria. In condition when such poultry becomes infected with *Brucella* species and the aborted foetuses are contaminated with *Brucella* species, the discharges from these placentae and aborted foetuses could find their way of the pasture which other animals could come and graze on. In the process, if these animals come and feed on the horses feeds, they could urinate and pass on the bacteria on the feeds which the horses could feed on and subsequently become infected. Kaltungo (2013) reported that *Brucella* organisms could be transmitted through ingestion of contaminated pasture, feeds and through feeding on any body fluids of *Brucella* infected animals like urine, and vaginal discharges.

They thought that mixing of these animals with their horses has no disease implications and this has demonstrated their lack of full knowledge of disease transmission, especially from one animal species to another. This seeming ignorance could be attitudinal since, as earlier on indicated some states in Nigeria organize training programmes for livestock owners. It could be also as they were not able to associate disease occurrence with certain activities in their stables. For example Baba (2016) strongly associated the exchange of grooming tools to the transmission and spread of brucellosis and ulcerative lymphangitis among horses in Kaduna State.

In the study, the grooms indicated some expertise in the use of plants like *Calotropes procera* and *Senna occidentalis* in horses with brucellosis. This observation needs to be confirmed. It could be possible the plants might have some chemical components that could be bactericidal or bacteriostatic. Only laboratory and clinical trials can confirm that. However, Kaltungo (2018a), in a study on brucellosis, also reported pastoralists indicating *Senna occidentalis* having good effect in the treating animals with brucellosis. The researcher also indicated that a plant, 'Loda,' was effective against brucellosis.

Through this study, it is evident that PE tools are capable of leading in the generation of sufficient original information from respondents more than structured questionnaires could generate. This is because the interviewees generated the data obtained from this study not only that they showed the levels of their knowledge and practices beyond what could have been generated from structured questionnaires. In addition the study provided local names of horse diseases which a structured questionnaire might not have provided. The transect walk gave an ample opportunity for providing pictorial presentation of animals with clinical diseases.

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CONFLICT OF INTEREST

Authors have no conflict interest to declare.

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