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Assessment of Sanitation and Hygiene Compliance and Identified Risk Factors Associated with Occupational Hazards in Some Veterinary Clinics and Hospitals in Ibadan

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Abstract

This study seeks to assess the sanitation and hygiene operational protocols, some of which will constitute risk factors to occupational hazards as a result of poor compliance levels in some veterinary clinics and hospitals around Ibadan. A cross sectional survey was carried out using 57-item pre-tested and well-structured checklist in 26 veterinary clinics and hospitals that were purposively sampled. The checklist was scored thus; 0-49% = Non-existent to poor and 50-100% = good to very good. For any veterinary clinic or hospital to be scored as having complied with any item, such a clinic or hospital must have scored ≥ 50%. All scores were analyzed using descriptive statistical program in percentage. The identified risk factors that can predispose to occupational hazards were poorly complied with, among which are viz., equipment in veterinary clinics and hospitals are improvised (31%), sterilization of aprons, clothing, bandages (38%), others are quarantine of animals brought to the clinics (15%), monitoring of the state of health of operators (0%), immunization of operators and support staff (15%) and report of zoonotic diseases due to clinical activities (8%). Others include hand washing utensils at the entrance (31%), compartmentalization of the building (38%), disinfection of equipment (42%) and location of water sources (46%). it was observed that all the items scored and not in compliance with laid down standards constitutes a risk factors which will eventually precipitate occupational hazards, and the predisposing risk factors to occupational hazards are more in the veterinary clinics than hospitals in Ibadan. We hereby recommend that the sanitation and hygiene operational protocols of running the veterinary clinics and hospital should be enforced and periodically reviewed. It is compulsory to develop risk assessment plans.

Keywords: Ibadan; Occupational hazards; Risk factors; Sanitation and Hygiene; Veterinary clinic and hospital

Introduction

Maintaining good hygiene and sanitation in veterinary clinics or hospitals is necessary for the reduction of outbreak and spread of infection, and also crucial for the well-being of both animals and humans [1].

The evolving understanding of infectious disease transmission and the interconnected roles of infrastructure and human health have shaped the modern science and practice of sanitation and hygiene [2]. Although the benefits of sanitation andhygiene are much broader than its health impacts alone, it is still promoted as a set of health interventions intended to interrupt transmission of infectious diseases originating from poor hygiene and sanitation. The control of infection within a veterinary clinic or hospital environment is probably one of the single most important roles of the veterinary personnel. The best possible care should always be given to patients and by so doing will reduce or eliminate the risk of spread of infection. From admission to discharge there are many points at which there are risks of infection; at any stage infection can be detrimental to the welfare and recovery of the patient [3]. Infection control is a dynamic and developing topic in both human and veterinary medicine. With this in mind, the infection control manual of the veterinary clinic or hospital should be reviewed and revised regularly in order to make it relevant [4]. Infections are considered hospital acquired (HAI) if they occur within 48 hours of admission of the patient or within 30 days after discharge [5]. The prevalence of HAIs for the veterinary patient is unknown. It is difficult to determine where the patient was exposed to the infection.

The veterinary profession exposes the personnel to a lot of health hazards. The major ones include physical health hazards (physical injuries), chemical/radiation health hazards and biological health hazards [6].

The health hazard can be defined as "a potential source of harm or adverse health on a person(s) [7]. According to the International Labour Organization (ILO), 2.3-2.7 million individuals/workers die each year as a result of work related injuries, resulting in a total loss of 2.99 trillion USD, or 3.94 percent of world gross domestic products (GDP). In terms of non-fatal occupational illnesses and injuries, veterinary services are ranked fifth in the United States. Information on workplace health and safety remains scarce or neglected in many low-to-middle-income countries Nigeria inclusive [8].

A veterinarian is a health personnel whose main aim is to protect the animal health, this exposes the personnel to a lot of disease causing agents leading to occupational zoonoses, a biological health hazards [9]. Veterinary medicine and animal care workers are at risk of exposure to zoonoses, infectious diseases that spread from animals to humans. Possible routes of transmission include aerosol, droplet spray, ingestion (oral), direct contact, indirect contact (e.g., fomite), or vector-borne. Sources of exposure include animals, body fluids, contaminated tools, surfaces, or other objects in the environment. Approximately 60% of the more than 1400 human pathogens are zoonotic. About 75% of emerging pathogens are zoonotic. Zoonoses reported in veterinary personnel include salmonellosis, cryptosporidiosis, plague, sporotrichosis, methicillin resistant Staphylococcus aureus (MRSA), psittacosis, dermatophytosis, leptospirosis, and Q fever. Other zoonoses of veterinary concern include rabies and toxoplasmosis [10]. All HAIs are preventable through the use of practical infection-control measures, especially good hygiene and sanitation [11]. It has been shown that large economic benefits are estimated to occur with the implementation of infection-control interventions [12]. The proportion of HAIs that are preventable in veterinary medicine is actually unknown, but is likely to be similar, and even a 10% reduction in infections and could constitute a major impact on patient health, owner cost, and owner and clinician satisfaction. The routine use of simple infection prevention practices can likely dramatically reduce HAIs and occupational hazards in the veterinary operations [13].

This study therefore seeks to assess the compliance levels of sanitation and hygiene operational protocols and risk factors leading to occupational hazards as a result of poor compliance levels in some veterinary clinics and hospitals around Ibadan.

Materials and Methods

Study Locations

The study area are twenty six Veterinary clinics and hospitals, around Ibadan metropolis. The twenty six veterinary clinics and hospitals were chosen based on availability, size and distribution within Ibadan metropolis. There are more than fifty veterinary clinics and hospital in Ibadan before now, but due to poor patronage as a result of poor location and/or quality of services dispensed majority folded up. Considering the aforementioned, we sampled and scored twenty six veterinary clinics and hospitals.

Preparation of Checklist and Locating Veterinary Clinic

This study was borne out of the need to prevent or possibly reduce the incidence of infection spread and contamination/HAIs in veterinary clinics or hospital as a result of non-compliance with practical hygiene and operational protocols.

The drafting and preparation of this checklist was drawn from previous studies in Africa, but adapted to suit veterinary clinic/hospital operations, experience from veterinary clinic/hospital hygiene and operations in Nigeria, and recommendations for improvement on existing hygiene and structures. A comprehensive checklist was developed based on three criteria: (i) Practical hygiene and sanitation at poultry houses, (ii) facilities, tools and equipment in use at veterinary clinics/hospitals, and (iii) Operational Protocols, policies and regulations. A total of 57 items were identified and included in the checklist after the removal of duplicates and these were arranged based on the three criteria previously stated to determine and evaluate the level of compliance. The prepared checklist was tested and thereafter, the pretested checklists were administered in at the veterinary clinics/hospitals. Permissions were sought from all the veterinary clinics/hospitals before the administration of the checklists.

Study Design, Sampling Procedure and Scoring of the Checklist

A cross sectional survey was carried out using 57-item pre-tested and well-structured checklist in 26 veterinary clinics/hospitals around Ibadan metropolis. All selected clinics/hospitals were visited between April and May, 2024. The 57-item pre-tested and well-structured checklist was scored as follows; observed practical hygiene and level of sanitation compliance: Non-existent to poor (0-49%) and good to very good (50-100%). For any veterinary clinic/hospital to be scored as having complied with any item, such a veterinary clinic or hospital must have scored ≥ 50%. The checklist was scored as follows; observed practical hygiene and level of sanitation compliance: Non-existent to poor (0-49%) and good to very good (50-100%). For any veterinary clinic or hospital to be scored as having complied with any item, such a farm must have scored ≥ 50%. All scores were entered into Microsoft Excel® (Microsoft Redmond, USA) and analyzed using descriptive statistical program for proportions (in percentage); and Student's t-test was used to check for significant differences for practical hygiene and level of sanitation between veterinary clinics and hospitals in Ibadan.

Results & Discussion

Results

Table 1 shows the results for Practical hygiene and level of sanitation compliance at some veterinary clinic and hospital in Ibadan. It was observed that out of the 22 items scored, 13 were well complied with (environmental cleanliness, waste disposal, washing and sterilization of equipment, availability and present state of toilets), while 9 were poorly complied with (presence of incinerator, access to facility to sterilize hand, safe disposal of dead animals and disinfection of infrastructure and equipment).

Table 1: Practical hygiene and level of sanitation compliance at some veterinary clinics and hospitals in Ibadan

S/N	Variable	Score (%) <50 >50	Remarks
1	Garbage & waste disposal services	4(15) 22(85)	V.good
2	Environmental cleanliness of the clinic/hospital	2(8) 24(92)	V.good
3	Presence of an incinerator in the clinic/hospital	26(100) 0(0)	Poor
4	Washing of treatment tools and equipment	0(0) 26(100)	V.good
5	Sterilization of the tools & equipment	0(0) 26(100)	V.good
6	Presence of drains in & around the structures	8(31) 18(69)	Good
7	Availability of sufficient, regular and clean water	0(0) 26(100)	V.good
8	Availability of toilets	4(15) 22(85)	V.good
9	Present state of the toilet	2(8) 24(92)	V.good
10	Access to facility to wash hands	7(27) 19(73)	Good
11	Access to facility to sterilize hands	15(58) 11(42)	Fair
12	Access to facility to bath prior to & after surgery	17(65) 9(35)	Poor
13	Safe disposal of dead animals	16(62) 10(38)	Poor
14	Safe disposal of waste	4(15) 22(85)	V.good
15	Good hygiene in the clinic/hospital premises	2(8) 24(92)	V.good
16	Good hygiene around different sections	2(8) 24(92)	V.good
17	Disinfection of infrastructure and equipment	15(58) 11(42)	Poor
18	Disinfection/fumigation of premises	15(58) 11(42)	Poor
19	Cleaning of clinic/hospital done routinely	4(15) 22(85)	V.good
20	Protective apparels available for operators	18(69) 8(31)	Poor
21	Hands washing after routine work	0(0) 26(100)	V.good
22	Hands sterilization after routine work	20(77) 6(23)	Poor

Scores: Non- existent to poor (0-49%) or < 50; Good to very good (50-100%) or ≥ 50

Table 2 shows the results of identified risk factors responsible for occupational hazards in some veterinary clinics and hospitals in Ibadan. Fourteen risk items were scored, only two of them were well complied with at the surveyed veterinary clinics and hospitals which are personal protective equipment (77%) and control of environmental waste (100%). Twelve of the risk factors that can predispose to occupational hazards were poorly complied with, among which are viz., equipment in veterinary clinics and hospitals are improvised (31%), one way traffic flow (31%), sterilization of aprons, clothing, bandages (38%), others are quarantine of animals brought to the clinics (15%), monitoring of the state of health of operators (0%), immunization of operators and support staff (15%) and Report of zoonotic diseases due to clinical activities (8%).

Table 2: Facilities, tools and equipment at the veterinary clinic/hospital which serve as predisposing risk factors to occupational hazards

S/N	Variable	Score (%) <50 >50	Remarks
1	Hand washing utensils at the entrance	18(69) 8(31)	Poor
2	Compartmentalization of the building	16(62) 10(38)	Poor
3	Isolation of clinic/hospital from residential houses	6(23) 20(77)	Good
4	Proper layout of structures	6(23) 20(77)	Good
5	Water delivery system in place in and around the clinic/hospital	14(54) 12(46)	Poor
6	Clearing of clinic/hospital surrounding is done routinely	4(15) 22(85)	V.good
7	Disinfection of equipment used in the clinic/hospital	15(58) 11(42)	Poor
8	Enough space for future expansion.	20(77) 6(23)	Poor
9	Location of water source	14(54) 12(46)	Poor
10	Facility for isolation/monitoring/admission of sick animals	8(31) 18(69)	Poor
11	Availability of X-ray machine	22(85) 4(15)	Poor

Scores; Non- existent to poor (0-49%) or < 50; Good to very good (50-100%) or ≥ 50.

Table 3 shows the results of identified risk factors responsible for occupational hazards in some veterinary clinics and hospitals in Ibadan. Fourteen risk items were scored, only two of them were well complied with at the surveyed veterinary clinics and hospitals which are personal protective equipment (77%) and control of environmental waste (100%). Twelve of the risk factors that can predispose to occupational hazards were poorly complied with, among which are viz., equipment in veterinary clinics and hospitals are improvised (31%), one way traffic flow (31%), sterilization of aprons, clothing, bandages (38%), others are quarantine of animals brought to the clinics (15%), monitoring of the state of health of operators (0%), immunization of operators and support staff (15%) and Report of zoonotic diseases due to clinical activities (8%).

Table 3: Identified risk factors responsible for occupational hazards in some veterinary clinics and hospitals in Ibadan

S/N	Variable	Score (%) <50 >50	Remarks
1	Layout of clinic/hospital complies with operational standards	20(77) 6(23)	Poor
2	Personal Protective Equipment are worn during activities	6(23) 20(77)	Good
3	Equipment in clinics/hospital are improvised	18(69) 8(31)	Poor
4	One way traffic flow in the clinic/hospital	18(69) 8(31)	Poor
5	Sterilization of clothing, bandages, apron etc	16(62) 10(38)	Poor
6	Animals are restrained before treatment	0(0) 26(100)	V.good
7	Quarantine of animals brought to clinic/hospital	22(85) 4(15)	Poor
8	Laboratory facility for prompt diagnosis	20(77) 6(23)	Poor
9	Upon diagnosis notifiable diseases are reported	23(88) 3(12)	Poor
10	Monitoring of the state of health of operators	26(100) 0(0)	Non-existent

11	Regulation of environmental waste disposal	6(23) 20(77)	V.good
12	Immunization of operators and support staff	22(85) 4(15)	Poor
13	Report of physical injuries/occupational hazard to operators in the clinic/hospital	20(77) 6(23)	Poor
14	Report of zoonotic diseases due to clinical activities	24(92) 2(8)	Poor

Scores; Non- existent to poor (0-49%) or < 50; Good to very good (50-100%) or ≥ 50.

Table 4 shows the results of Comparison of practical hygiene and sanitation compliance level between veterinary clinics and hospitals in Ibadan metropolis. Out of the 22 items compared, 12 were significantly ($p < 0.05$) complied with by the operators of the veterinary hospitals better than those of the veterinary clinics, they include the following viz., environmental cleanliness (0.020), presence of an incinerators (0.001), sterilization of tools and equipment (0.001), access to facility to wash hand (0.02), access to facility to sterilize hand (0.04) among others.

Table 4: Comparison of practical hygiene and sanitation compliance level between veterinary clinics and hospitals in Ibadan metropolis

S/N	Variable	Score (%) <50 >50	Remarks
1	Garbage & waste disposal services	2.750 2.400	0.25
2	Environmental cleanliness of the clinic/hospital	3.200 1.850	0.02
3	Presence of an incinerator in the clinic/hospital	1.750 0.000	0.001
4	Washing of treatment tools and equipment	2.450 2.250	0.525
5	Sterilization of the tools & equipment	3.750 1.500	0.001
6	Sterilization of the tools & equipment	2.500 1950	0.45
7	Availability of sufficient, regular and clean water	2.350 2.050	0.075
8	Availability of toilets	3.750 1.750	0.0001
9	Present state of the toilet	3.000 2.650	0.075
10	Access to facility to wash hands	3.450 1.900	0.02
11	Access to facility to sterilize hands	2.950 1.550	0.04
12	Access to facility to bath prior to & after surgery	3.700 2.200	0.001
13	Safe disposal of dead animals	2.750 2.250	0.065
14	Safe disposal of waste	2.800 2.500	0.275

15	Good hygiene in the clinic/hospital premises	3.500 2.250	0.002
16	Good hygiene around different sections	3.250 2.200	0.001
17	Disinfection of infrastructure and equipment	2.95 2.000	0.04
18	Disinfection/fumigation of premises	3.000 2.800	0.2
19	Cleaning of clinic/hospital done routinely	3.250 2.950	0.475
20	Protective apparels available for operators	3.850 1.750	0.001
21	Hands washing after routine work	3.250 3.150	0.35
22	Hands sterilization after routine work	2.950 1.500	0.02

*Significant @ p< 0.05

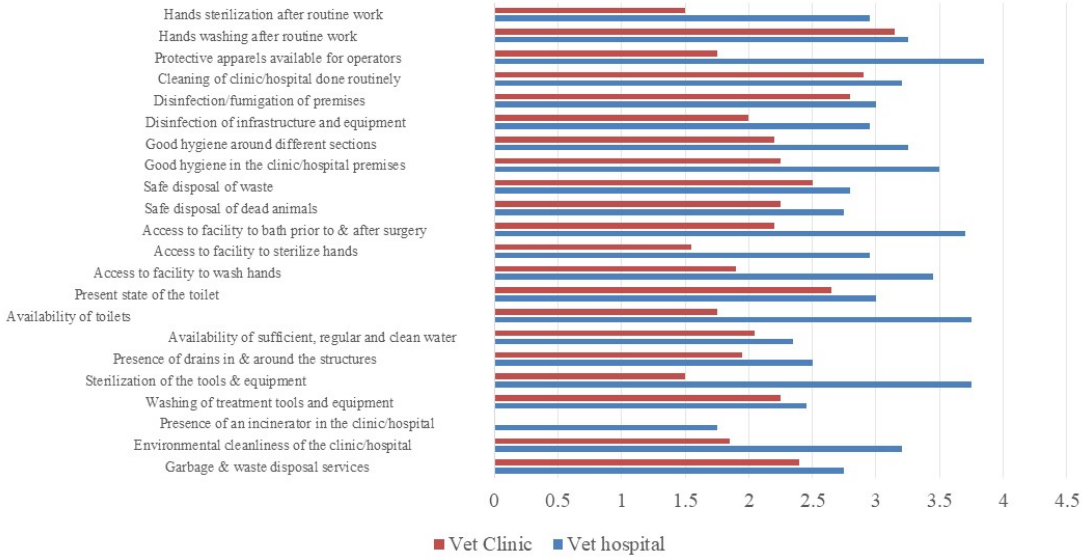

Figure 1: Graphical comparison of practical hygiene and sanitation compliance level between some veterinary clinics and hospitals in Ibadan metropolis

The graphical representation for the comparison of practical hygiene and sanitation compliance level between some veterinary clinics and hospitals in Ibadan metropolis is shown in Fig. 1. This graph shows that the veterinary hospital (blue) complied better than the veterinary clinics (red) for all the items scored.

Discussion

It was observed from this study that following the scoring of practical hygiene and sanitation, parameters at the surveyed veterinary hospitals and clinics around Ibadan metropolis; there was partial compliance to some of these items which is tantamount to the identified risk factors which will eventually predispose to the occupational hazards. The outcomes of non-compliance to identified risk parameters in these veterinary hospitals and clinics was more than those that complied with it. The failure to as-

sess risks by stake holders can lead to accidents, fines and imprisonment (which cannot be insured for), claims for compensation, bad publicity and the sheer personal trauma of being responsible for a death or injury. Risk assessments must be recorded in writing and reviewed periodically [11]. It was observed that physical injuries are poorly reported in this study as stated by operators, this is in tandem with the earlier submission of Adebowale et al, [8], which states that the frequency of contact with various animal species increase the likelihood of operators' exposure to hazards, especially, the physical animal-related injuries such as bites, scratches/bruises, and kicks. occurrence of such happen but it is rarely reported, hence a risk to physical health hazard [8]. Also, following the scoring of fifteen items under facilities, tools and equipment, nine of the items were well complied with by the operators of the veterinary clinics and hospital, while the remaining six were poorly complied with; among which include hand washing utensils, location of water sources and water delivery system, facility for isolation of sick animals and space for expansion (Table 2).

The non-availability of hand washing utensils at the entrance of some of the veterinary clinics or hospitals in Ibadan will affect hand hygiene, which is a major risk factor responsible for microbial proliferation and transmission that will eventually lead to biological health hazard [6]. Hand hygiene prevent the physical translocation of microbes between patients, staff, and the environment, thus decreasing potential host exposure and preventing infection [12]. The standard of care at every veterinary hospital should include a high level of hygiene, awareness of the dangers of transfer of infectious agents between both animals and people, and procedures to reduce infection risk wherever possible. Such infection control procedures are intended to prevent (limit) introduction and spread of infectious diseases within a group of patients and their veterinary stakeholders, thereby, protecting human, animal, and environmental health against biological threats [13]. The poor disinfection or sterilization of infrastructures, equipment and hands will cause the contamination of surfaces that will also impact negatively on the treatment of patients and humans can also be affected [1]. On the contrary, proper sterilization ensures that the animals are safely treated without risking the transmission of infections (Table 1). The most obvious reason to sterilize equipment is for safety. Every veterinarian should be committed to keeping up with guidelines and laws regarding sterile veterinary equipment and the easiest way to do so is to make sure you have got the right sterilization equipment for the work you do [14].

The location of the sources of water has effect on the drinking water quality, water quality is a global issue, with contaminated unimproved water sources and inadequate sanitation practices causing human and animal diseases [15]. Forty-two percent of the people and unquantifiable number of animals living in Sub-Saharan Africa drank from unimproved water sources and 72% are without basic sanitation [16]. This type of bad quality water will serve as medium for contamination of surfaces, equipment, environment and animals. Water sources particularly unimproved sources are contaminated not only due to anthropogenic factors but also natural factors such as flooding, topography, and others [17]. The necessary facility for separating sick from healthy animals is lacking at majority of the surveyed veterinary clinics and hospital around Ibadan. This facility is referred to as the isolation or quarantine unit. To quarantine, by definition, is to detain and isolate on account of suspected contagion for purposes of assessment and management of such. Functionally, the goals of quarantine are to protect resident colonies from contagions, safeguard personnel from exposure to zoonoses, minimize the transmission of diseases between animals in quarantine, and optimize the health and condition of the newly acquired animals [18] [table 2].

The immunization of operators with important vaccines in the surveyed veterinary clinics and hospitals is poorly complied with. The vaccination of the animal handlers and other personnel in the veterinary clinic should be a necessity so as to confer immunity against some zoonotic diseases. In this study however, about 85% of the surveyed locations do not make provision for staff vaccination (Table 3), which is supposed to be a protective mechanism aimed at preventing occupation hazard [19]. This finding was also in line with the submission of Adebowale et al. [8], that rabies infection was primarily a concern to veterinary clinic workers due to its attendant high fatality and transmission sources and inadequate immunisation against the infection. Rabies is a known tropically neglected, but preventable disease both in humans and dogs [20]. An estimated 21,476 human deaths occur each year in Africa due to dog-mediated rabies [21]. It was observed that majority (92%) of the veterinary

clinics and hospitals surveyed have the bad habit of not reporting diagnosed zoonotic diseases, by so doing this will facilitate the spread of the so called disease. Early detection and reporting of disease in humans and animals is crucial to the effective surveillance and arrest of such disease [22]. When the compliance levels of practical hygiene and sanitation were compared between `some veterinary hospitals and veterinary clinics in Ibadan. It was observed that compliance to scored health items where better at the veterinary hospitals than the clinics around Ibadan metropolis especially good hygiene, disinfection, sterilization and the use of protective apparels (Table 4, Fig. 1). All these if not properly complied with will serve as risk factors that could predispose to contamination and will eventually lead to health issues to patients and humans [1].

Inflection prevention and control is a scientific approach and practical solution designed to prevent harm caused by infection to patients and health workers [1]. Therefore, maintaining high standards of hygiene and cleanliness in veterinary practice is vitally important to ensure the safety of patients, staff and clients by minimising risk of acquiring infection whilst on the premises (occupational hazards). Key infection control protocols play an important part in maintaining practice hygiene [1].

The micro-organisms that cause hospital-acquired infections are generally highly antibiotics-resistant, requiring expensive antibiotics and further hospitalization. Appropriate hospital disinfection and staff hygiene practices can prevent such infections by reducing the pathogen load in a facility in accordance with the "nosocomial prevention triad"-appropriate antibiotic usage, staff and patient hygiene, and hospital maintenance and disinfection [26]. Hand hygiene (HH) is considered one of the most important infection control measures in human healthcare [27, 28] and the most efficient way to reduce transmission of pathogens between healthcare workers and patient [29]. Despite these benefits, this study further corroborate the submission of [30] that HH compliance in human healthcare workers is poor, and highly variable, and hence high prevalence of occupational hazards in veterinary practical.

Conclusion

Following the evaluation of identified risk factors and safety standards at the scored veterinary clinics and hospitals in Ibadan, it was observed that all the items scored which are not in compliance with laid down standards constitutes risk factors, among which are; improvising equipment, quarantine of animals, sterilization and disinfection of equipment, aprons, bandages, monitoring of the state of health of operators, immunization of operators, location of water sources among others). All these will eventually precipitate occupational hazards.

The lack of safe sanitation and hygiene will expose workers to risk factors that will eventually lead to occupational hazards and public health concern which may lead to death. As a result of the poor compliance to hygiene and sanitation, policies on enforcement of compliance should be formulated to enhance good health and reduction in risk factors and/or occupational hazards during veterinary operations in clinics and hospitals in Ibadan. Veterinary clinics and hospitals should make compulsory safety standards like vaccination of personnel (especially with anti-rabies vaccine and anti-tetanus serum), It is compulsory to develop risk assessment plans and also health and safety guidelines, which must also be periodically reviewed.

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