

## Original Research Article

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# Perception of risks and safe handling practices of corpses among morticians in Ibadan, Oyo state

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## ABSTRACT

**Background:** It is well known in many Sub-Saharan countries that many morgues that are designed and built to earlier standard are no longer compatible with current occupational health and safety practices. This study therefore aimed to investigate the perception of risks involved and safe handling of corpses among morticians in Ibadan, Oyo State, Nigeria.

**Methods:** We conducted a cross-sectional study among 42 morticians in Ibadan in 2017 using both quantitative and qualitative methods of data collection. An interviewer-administered questionnaire was used to obtain information from morticians. A key informant interview was also conducted with each supervisor of the various facilities.

**Results:** Respondents' mean age was  $42.1 \pm 11.4$  years, 39 (95.1%) were males, and 14 (35%) had no formal education. The most dangerous communicable diseases that the respondents were aware of included Lassa fever among 38 (95.0%), Ebola among 35 (87.5%), tetanus among 34 (85.0%), tuberculosis among 31 (77.5%), and hepatitis B among 25 (62.5%). In all, 36 (90%) of the respondents had inhaled chemicals during work leading to cough, excessive sneezing and eye irritation. Protective gown was well known among all 42 (100%) respondents. Work-associated injuries such as sharp injury, splash of chemicals, slip, trip and falls were least ranked. Some of the facilities (33%) had written program based on the requirement of the World Health Organization.

**Conclusions:** Government, stakeholders and bodies responsible for managing mortuaries should not only pass law and enforce them but also provide avenues (seminars, lectures, webinars etc.) where knowledge can be shared and modern industry safe practices can be achieved.

**Keywords:** Risk assessment, Morticians, Work practices, Corpses, Occupational health and safety, Personal protective equipment, mortuary workers

## INTRODUCTION

Morticians work in the mortuary and their primary function in the morgue is to embalm the dead human bodies. The history of embalming dates back to 4000 BC, having started as a simple treatment of the body with herbs (before 4000 BC) and later improving into a complex procedure using chemical solutions in the late 1600's. In the 19<sup>th</sup> century, techniques were developed for infusion of embalming fluid into the vascular system;

formaldehyde being used as an embalming agent since its tissue-hardening properties were discovered in 1893. Three main aims achieved through embalming are disinfection, preservation, and restoration of the human remains, all of which are done at the mortuary.<sup>1</sup>

In many sub-Saharan African countries, many mortuaries which were designed and built to earlier standards are no longer compatible with current good work practices for occupational health safety (OHS).<sup>2</sup> This makes morgue workers to be specifically vulnerable to occupationally

acquired infectious diseases as shown by recent experiences.<sup>3</sup> Majority of workers in the morgue, like in other sectors, face hazards and risks often resulting in occupational-related injuries and deaths.<sup>4</sup> Examples of these hazards are infectious diseases, chemical and psychosocial hazards among others.<sup>5</sup>

With an estimated 2.3 million deaths per year from occupational accidents and diseases, occupational safety and health administration (OSHA) has become a universal obligation for every workplace as enforced by the international labor organization (ILO).<sup>6</sup> It is estimated that the annual death rate for healthcare workers (HCWs) from occupational events, including infection is 17-57 per 1 million workers.<sup>7</sup>

Despite high global OHS-related mortality, there is lack of information on the potential of OHS exposures among mortuary workers in government health facilities. From primary health care to millennium development goal to sustainable development goal, there is no portion where the management of human corpse was mentioned and this is part of our daily living and can adequately pose a threat to health of the citizenry. This study aimed to investigate the perception of risks involved and safe handling of corpses among morticians in Ibadan, Oyo State, Nigeria.

## METHODS

### *Study design*

This study was a descriptive cross-sectional study (which employed both quantitative and qualitative methods) among morticians in Ibadan.

### *Study area*

Ibadan is the capital city of Oyo state with a population of over 3 million. Ibadan is also the most populous city in Oyo state, and the third most populous city in Nigeria, after Lagos and Kano; it is the country's largest city by geographical area.

### *Study population*

This study was conducted at both government-controlled and privately owned registered mortuaries that are functioning within Ibadan, Oyo-state between August 2017 to December 2017. Forty-two morticians who were physically present at the mortuaries during the process of data collection were included in the study. All morticians who did not hold current membership license for year 2016 with the national association of morticians and funeral directors were excluded from the study.

Face-to-face interviews were conducted with a pre-tested structured questionnaire to elicit information from respondents. Key informant interviews were conducted with morticians in charge. Data were entered and

analyzed using SPSS version 21.0 and NVIVO version 10.

Ethical approval for this study was from the Oyo state ministry of health ethical review board with reference number AD 13/479/542. Informed consent was obtained from participants before questionnaires were administered. Participants were informed that participation was voluntary and their privacy and confidentiality were assured before the commencement of data collection. No form of harm was inflicted on individuals if they chose not to participate or to withdraw from the study at any point.

## RESULTS

### *Quantitative analysis*

A total of 42 questionnaires were distributed with 40 returned and completely filled. This yielded a response rate of 95.2%. Further analysis of the data is shown below.

### *Socio-demographic characteristics*

The mean age of respondents was  $42.05 \pm 11.42$  years while they had been in the profession for an average of  $10.85 \pm 2.92$  years. Among the respondents, 39 (95.1%) were males while 36 (90%) were married, and 14 (42.5%) of the respondents had completed tertiary level of education. Also, 9 (22.5%) of them had no form of training before starting off their career. As at the time of the study, 23 (57.5%) were not being paid any kind of hazard allowance while 25 (62.5%) were registered with the national health insurance scheme (NHIS) as shown in Table 1.

### *Safe health and handling guideline practices at Morgue*

The most common susceptible diseases that the respondents were aware of included Lassa fever 38 (95.0%), Ebola 35 (87.5%), tetanus 34 (85.0%) while tuberculosis 31 (77.5%) and hepatitis B 25 (62.5%) were the least. Among them, 33 (82.5%) thought their work predisposed them to HIV, while 31 (77.5%) thought their work placed them at risk for Ebola, and 30 (75.0%) felt susceptible to Lassa fever through their work. Among them, 13 (32.5%) had completed all 3 stages of hepatitis B vaccination, while 25 (62.5%) of them had gone for HIV testing during their career (Table 2).

Among those who had received hepatitis B and tetanus vaccination, the median number of years since their last vaccination was 7 years for both diseases.

Table 3 shows the responses of the study participants when quizzed about the methods through which they could contract some of the common diseases in their line of work. Among them, 23 (57.5%) did not believe that hepatitis B could be contracted through body fluids, while

25 (62.5%) did not believe body fluids could transmit HIV. Similarly, 9 (22.5%) did not believe that HIV could be transmitted through blood. Also, 23 (57.5%) respondents did not believe that needle stick injuries could transmit HIV.

Concerning workplace incidents, 20 (50%) respondents had experienced splash of body fluids of corpses on them. Of these, 6 (30%) had splash on the eyes, 5 (25%) on open cut, and 3 (15%) on the mouth). Regarding the most common disease experienced due to work, 4 (10%) respondents stated typhoid. Also, 36 (90%) respondents had inhaled chemicals during work. Among them, 26 (65%) each experienced eye/mucus membrane irritation or cough/sneezing. Also, 20 (50%) experienced fatigue, while 3 (7.5%) reported cancer caused by chemicals used at their work place (Table 4).

#### *Awareness and use of PPE*

The protective/isolation gown was the most popular personal protective equipment (PPE) known among the

respondents (100.0%) while the eye google was the least. The most frequently used PPE was the protective glove, closely followed by the nose mask and protective boots. The least used was once again the eye goggle. Among morticians, 25 (62.5%) had been injured at the workplace while 12 (48%) had experienced injury from sharps. Also, 10 (40%) injured morticians did not report, while 5 (20.0%) of the injured morticians were delayed before reporting. Among them, 10 (66.7%) morticians said the management provided healthcare services for them, while 3 (20.0%) were left by the management to cater for themselves as shown in the Table 5.

Among them, 29 (72.5%) always wore protective gown, and 8 (20%) has never worn protective gown. Also, 31 (77.5%) always wore protective glove, while 5 (12.5%) never wore protective glove. Further, 30 (75%) always wore protective boot, while 6 (15%) never wore protective glove (Table 6).

**Table 1: Socio-demographic characteristics.**

Variables	N	Percentage
<b>Gender</b>		
Male	39	95.1
Female	2	4.9
<b>Marital status</b>		
Single	3	7.5
Married	36	90.0
Divorced	1	2.5
<b>Educational status</b>		
No formal education	14	35.0
Primary	3	7.5
Secondary	6	15.0
Tertiary	17	42.5
<b>Ethnicity</b>		
Yoruba	37	92.5
Hausa	2	5.0
Igbo	1	2.5
<b>Employment status</b>		
Temporary	4	10.0
Permanent	36	90.0
<b>Prior related training</b>		
Yes	31	77.5
No	9	22.5
<b>Salary increment</b>		
Range of salary increment, (n=20)	22	55.0
N5000 and less	6	30.0
More than N5000	14	70.0
<b>Paid risk/hazard allowance</b>		
Yes	17	42.5
No	23	57.5
<b>NHIS registration</b>		
Yes	25	62.5
No	15	37.5

**Table 2: Safety practices adhered to at facilities by morticians.**

Variables	N	Percentage
<b>Heard of hepatitis virus?</b>		
Yes	25	62.5
No	15	37.5
<b>Do you think your work can predispose you to hepatitis B virus?</b>		
Yes	22	55.0
No	18	45.0
<b>Have you been diagnosed of hepatitis since you started working in a morgue?</b>		
Yes	11	27.5
No	29	72.5
<b>Have you ever been vaccinated against hepatitis B virus since you started this work?</b>		
Yes	17	42.5
No	23	57.5
<b>Have you completed the three stages of hepatitis B vaccination?</b>		
Yes	13	32.5
No	27	67.5
<b>Have you heard of tetanus?</b>		
Yes	34	85.0
No	6	15.0
<b>Do you think your work can predispose you to tetanus?</b>		
Yes	26	65.0
No	14	35.0
<b>Have you been diagnosed of tetanus since you started working in a morgue?</b>		
Yes	9	22.5
No	31	77.5
<b>Have you heard of tuberculosis?</b>		
Yes	31	77.5
No	9	22.5
<b>Do you think your work can predispose you to tuberculosis?</b>		
Yes	27	67.5
No	13	32.5
<b>Have you ever been diagnosed of tuberculosis since you started this work?</b>		
Yes	7	17.5
No	33	82.5
<b>Do you think your work can predispose you to HIV?</b>		
Yes	33	82.5
No	7	17.5
<b>Have you been tested for HIV since you started this work?</b>		
Yes	25	62.5
No	15	37.5
<b>Have you heard of Ebola virus?</b>		
Yes	35	87.5
No	5	12.5
<b>Do you think your work can predispose you to Ebola virus?</b>		
Yes	31	77.5
No	9	22.5
<b>Have heard of Lassa fever?</b>		
Yes	38	95.0
No	2	5.0
<b>Do you think your work can predispose you to Lassa fever?</b>		
Yes	30	75.0
No	10	25.0

**Table 3: Perception of transmission routes of common diseases.**

Variables	Blood, n (%)		Needle stick, n (%)		Feco-oral, n (%)		Body fluid, n (%)	
	Yes	No	Yes	No	Yes	No	Yes	No
<b>Hepatitis B</b>	18 (45.0)	22 (55.0)	7 (17.5)	33 (82.5)	3 (7.5)	37 (92.5)	17 (42.5)	23 (57.5)
<b>Tuberculosis</b>	12 (30.0)	28 (70.0)	6 (15.0)	34 (85.0)	9 (22.5)	31 (77.5)	18 (45.0)	22 (55.0)
<b>HIV</b>	31 (77.5)	9 (22.5)	17 (42.5)	23 (57.5)	2 (5.0)	38 (95.0)	15 (37.5)	25 (62.5)
<b>Ebola</b>	20 (50.0)	20 (50.0)	4 (10.0)	36 (90.0)	8 (20.0)	32 (80.0)	25 (62.5)	15 (37.5)
<b>Lassa fever</b>	21 (55.0)	18 (45.0)	4 (10.0)	36 (90.0)	10 (25.0)	30 (75.0)	22 (55.0)	18 (45.0)

**Table 4: Workplace safety and related health conditions from chemical use.**

Variables	N	Percentage (%)
<b>Ever had fluids splash on body</b>		
Yes	20	50.0
No	20	50.0
<b>Site of splash, (n=20)</b>		
Open cut	5	25.0
Mouth	3	15.0
Eyes	6	30.0
Others*	6	30.0
<b>Frequency of splash, (n=20)</b>		
Few times	14	70.0
Often	6	30.0
<b>Disease experienced due to work</b>		
Typhoid	4	10.0
Diarrhea	1	2.5
Skin rash	1	2.5
<b>Method of disposal in facility</b>		
Dedicated waste bin	33	82.5
Wash and reuse	4	10.0
Others	3	7.5
<b>Any health issues associated with chemicals</b>		
Yes	27	67.5
No	13	32.5
<b>Have you ever inhaled chemicals</b>		
Yes	36	90.0
No	4	10.0
<b>Kind of condition developed from chemical use (multiple response)</b>		
Skin irritation	16	40.0
Eye/mucus membrane irritation	26	65.0
Breathing difficulty	20	50.0
Cough/excessive sneezing	26	65.0
Headache	17	42.5
Fatigue	20	50.0
Chest tightness	14	35.0
Nose bleeding	6	15.0
Hypersomnia	8	20.0
Cancer	3	7.5

**Table 5: Awareness of PPE, workplace injuries and management actions.**

Variables	N	Percentage (%)
<b>Protective/isolation gown</b>		
Yes	40	100.0
No	0	0.0
<b>Eye goggle</b>		
Yes	30	75.0
No	10	25.0
<b>Glove</b>		
Yes	40	100.0
No	0	0
<b>Nose mask</b>		
Yes	39	97.5
No	1	2.5
<b>Workplace injuries and management actions</b>		
<b>Ever been injured at workplace</b>		
Yes	25	62.5
No	15	37.5
<b>Cause of injury (n=25; multiple response)</b>		
Sharps	12	48.0
Chemical splash	10	40.0
Slip, trip and falls	3	12.0
Others	4	16.0
<b>Action taken after sustaining injury</b>		
Continue with the work and reported to the authority afterwards	5	20.0
Reported to the authority immediately it occurred	10	40.0
Continue with the work without reporting the case	10	40.0
<b>Management response, (n=15)</b>		
Provide healthcare	10	66.7
Left worker to treat self at own expense	3	20.0
Left worker to treat self at facility expense	2	13.3
<b>Reason for not reporting, (n=10)</b>		
Delayed response	1	10.0
No response	4	40.0
Believed injury was minor	5	50.0

**Table 6: Frequency of PPE use among respondents.**

Variables	Always, n (%)	Rarely, n (%)	Never, n (%)
<b>Protective gown</b>	29 (72.5)	3 (7.5)	8 (20.0)
<b>Eye goggle</b>	20 (50.0)	10 (25.0)	10 (25.0)
<b>Protective glove</b>	31 (77.5)	4 (10.0)	5 (12.5)
<b>Nose mask</b>	30 (75.0)	3 (7.5)	7 (17.5)
<b>Protective boot</b>	30 (75.0)	4 (10.0)	6 (15.0)

### Qualitative analysis

The results of qualitative enquiry into the perception of risks and safe handling practices of corpses among morticians are presented in this sub-section.

#### Workplace conditions

The respondents had varied opinions on the sufficiency of morticians in their facilities. While some respondents said that the number of morticians, they had was adequate, others complained about inadequacy in the number of morticians available. For example, some of the respondents believed that the number of morticians available was enough.

“We have enough morticians to cater for dead bodies brought to the facility.”-Mortician 4.

“There are enough morticians in this facility that can cater for a dead body. For instance, if they bring in a dead body, two morticians are around to put such ones on stretcher.”-Mortician 1.

At the other end of the scale, some of the responses given by morticians who felt that their number was inadequate were as follows.

“They are not adequate. In case of multiple accident like burnt accident victims, 2 or 3 morticians are not enough to cater for the circumstance at hand.”-Mortician 9.

“In my own opinion, the number of morticians is not enough. Various factors from government and private sectors like inability to pay morticians as at when due or bad salary payments does not make morticians to be adequate.”-Mortician 10.

The disparity in responses continued when morticians were asked about the difference between emergency and non-emergency situations. While some morticians talked about the nature of death, others responded within the context of the number of bodies to attend to simultaneously.

“The only emergency is when they bring mass bodies here due to an accident or something. And with the

number of morticians we have, we can handle that effectively.”-Mortician 12.

“During emergencies there is much workload and we have to make sure that we tidy up the corpses at hand” While during non-emergencies, there is no pressure.”-Mortician 11.

“We cater for road accident victims when they are brought, we have enough space for such situations and a mortician is available to work with the supervision of a technologist. In non-emergencies, families deposit the body of their dead for storage and embalmment alone.” -Mortician 10.

“We actually don’t have any emergencies; we have to make sure that the body is confirmed dead with the death certificate. And if two corpses are brought simultaneously, we attend to them one after the other.”-Mortician 3

Yet another group of respondents believed that the emergency was in a health-related context, which necessitated their explanation that as dead bodies, corpses could not have medical emergencies.

“There are no emergency situations, only dead bodies are brought here.”-Mortician 2.

“Dead corpse is not an emergency; the person is dead before they brought him or her here.”-Mortician 4.

#### *Awareness and attitudes towards the use of PPE and adherence to safety guidelines*

Respecting the attitudes of morticians towards safety practices, many of the responses bordered on how morticians knew the seriousness of their jobs and how dangerous it could be. As a result, many of the respondents believed that morticians in their facility were professional about their duties.

“If you are into this job you need to take care of yourself first. You need to get protected and be extra careful because you don’t know the health issues of the dead body.”-Mortician 7.

“They know the procedures that they have to ensure safety practices when dead bodies are brought here.”-Mortician 2.

Still other morticians emphasized on how their colleagues treat the use of personal protective equipment very seriously in order to ensure that they are protected.

“They put on personal protective equipment whenever they want to deal with dead body.”-Mortician 5.

“Safety first is emphasized; they must put on personal protective equipment.”-Mortician 3.

“They ensure to protect themselves. They already know that they must put on their personal protective equipment.”-Mortician 12.

Some morticians interviewed lamented that there was no form of training, periodic or sporadic, for them in their line of duty.

“There is no training. It is something they are used to and it is part and parcel of them. So, they are used to it already”-Mortician 1

“It is not usually carried out here.”-Mortician 9.

However, some other morticians acknowledged that even though periodic trainings were not organized for them, they received special training during disease outbreaks such as the Ebola and Lassa fever epidemics.

“We really don’t have any. But during the Ebola and Lassa fever crisis, we were given training on how to handle these bodies with extra caution so as not to get infected as morticians.”-Mortician 11.

No periodic training, since they are used to the work already...But during the outbreak of Ebola and Lassa fever, we were given training so as to get protected and not to get infected with the disease.”-Mortician 8.

As for guidelines being followed at the respective facilities, there was no mention made by any mortician about any health policy either at national or state level that guides their practice. On the contrary, some morticians mentioned that an unspoken and in various cases, unwritten code was what was followed. According to their responses, every mortician was left to practice as he felt best.

“There are no guidelines but then we use our initiative.”-Mortician 9.

“...the clients call me and send location to me and I call my fellow morticians they know the necessary things to do.”-Mortician 1.

“When a corpse is brought here, it is placed on the stretcher. The people that will embalm the dead body are on hand to do their job. Each mortician here knows what to do when it comes to handling dead bodies.”- Mortician 2.

Despite this trend, there were still a few of the respondents who knew of certain guidelines that regulated their practice. Some of these guidelines include, the sequential steps to be taken, what equipment to use and how to use them.

“Standard guidelines so as to get protected is used here.”-Mortician 11.

“When corpses are brought here, we get to know the cause of the death. After that we put on our personal protective equipment and start work. Without putting on our protective equipment we can’t work.”-Mortician 7.

#### *Workplace injuries and occupational hazards*

All of the morticians denied having health emergencies during the course of carrying out their jobs.

“Tetanus vaccine is taken yearly and regular medical checkup is done in the University health center.”-Mortician 10.

Still on the matter, there was an exception of a mortician, who although denied having emergencies, stated some common health issues such as fever, weight loss etc. which are associated with their line of work.

“Yes, formalin causes catarrh and cough, body weakness, back ache when we want to lift dead bodies, sight impaired, weight loss effect which leads to breaking down of body immunity gradually due to the effect of formalin; in fact, one of our workers got infected with cancer, effect of needle pricking during injection and the fumes of the injection that enters through the oral and fecal enters through the eyes and nose. During blade cutting we also encounter constant fever.”- Mortician 9.

#### *Challenges faced by morticians*

Common challenges faced by morticians and expressed in this study were several. Some of them were inadequate staffing, poor welfare, lack of access to the proper equipment and client behavior. Another challenge which was discussed by a few morticians was the poor reputation given to their profession.

“Humanly behaviors like seeking attention first by our clients and other traits, though it occurs not frequently.”-Mortician 3.

“Price of the job, some clients are not ready to pay for the service and they want it cheap”-Mortician 5.

“The mentality people have about dead body is just not right. They feel it should not be expensive since the person is dead and they start telling you that in one place they collect small money but then the standard of this place is not comparable.” -Mortician 7.

The use of formalin seemed to be a challenge as well as some of the respondents mentioned it as giving them health issues.

“If we can use any other means of embalming asides from formalin and also those that come to carry their corpse say that it’s not their corpse.”-Mortician 8.

“I get tired due to exposure of formalin.”-Mortician 6.

### *Proposed solutions and recommendations*

As solutions to the above presented challenges and other issues, the respondents suggested several policies and improvements that they would like to see applied to their profession. These improvements revolved around the areas of staff welfare, adequacy of staff and provision of the required equipment.

“Availability of the equipment’s we use and reduction in their costs, also they should tar our roads for safe delivery of dead corpse.”-Mortician 3.

“Government should see to it that there are more morticians, so that during emergency they will be able to carry out their work properly and also they should pay our salaries regularly and even increase it.”-Mortician 11.

The importance of provision of training opportunities was highlighted by some of the respondents as well, who believed that such training, along with supportive supervision, would not only improve the quality of work but also better image of the profession to general public.

“Government should get to make sure that the so-called morticians have the formal knowledge about this job. It involves more than just tracing the arteries, they should check from time to time what is going on in the mortuaries.”-Mortician 7.

“Government should establish training schools for morticians to ensure standard training. When this is done, professional ethics will be practiced. And many people believe that this work of mortician is meant only for illiterates and that it’s meant for old people. When there is a training school, morticians will have a sense of belonging to people they will be proud to tell people what their job entails and that they are proud to be one. School of mortician will reduce the misconceptions people have about morticians. Also, all the morgues that are functioning should be well licensed because many of them don’t have license and don’t have people to correct them on what they need to do and what they are not supposed to do.”-Mortician 9.

Another point was the burden of the ever-growing taxes that facilities were being asked to pay. According to respondent, this may lead to some facilities by-passing the law.

“Also, our tax is been increased every time whether we get jobs or not. Those people that don’t have certificate don’t pay, and they by-pass the law, government sees to it that these ones are dealt with.”-Mortician 3.

## **DISCUSSION**

This study found out that of the half of the respondents who had experienced fluid splash, open cuts were the most common site of the splash. Similarly, other studies

in Nigeria have shown that occupational exposure to body fluids can result from muco-cutaneous injury (splash of blood or other body fluids into the eyes, nose or mouth.<sup>5,8</sup> This is an indication that despite their self-assessed positive attitude to the use of PPE, several mortuary workers do not actually practice the use of PPE as often as should be. This situation has been noted in other studies in developing countries and cited as one of the reasons why more of the infections from this type of injury is more common in developing countries.<sup>9,10</sup>

### *Personal protective clothing*

The protective or isolation gown was found to be the most known PPE alongside the glove, closely followed by the nose mask and protective boots. In a study conducted in Lagos State, the boots and the nose masks were the most popular PPE reported.<sup>11</sup> Safety goggles were also found by both studies as one of the least known PPE. This suggests that the safety goggles are the least popular among mortuary workers. With this finding, it becomes evident why according to this study, the eyes were the most common sites of fluids splash among the mortuary workers. The usage of the appropriate PPE at each phase of the work process has been emphasized as one of the most important ways by which work-related infections can be reduced. However, unless health workers know the PPE and its usefulness, it is unlikely that they use them.<sup>12</sup> This is also evidenced in this study by the low response rate of respondents who believed that eye goggles should be worn always during work with corpses. Other studies also reported low figures of mortuary workers who believe safety goggles, ranging from 31% and 50%.<sup>10,11</sup>

### *Occupational health risk for morticians*

Workplace injuries continue to be common with almost two-thirds of respondents in this study reporting injuries. This is a trend that has been observed both in the field under study as well as among other health professions. For example, the associated death rate was said to increase 58% from 41 to 65 deaths per 100,000 population in the United States while mortality due to respiratory tract infections increased by 20% from 25 to 30 deaths per 100,000 population.<sup>13</sup> This shows that the problem of increasing occupational health risks is not a unique problem for developing or low-income countries; rather, it seems to be a global concern. The related finding in this study that sharps were the most common cause of injury is supported by other studies both within and outside the country. In their study in Lagos, Nigeria, Oguntona et al cited sharp instruments as the most frequent cause of workplace injuries among mortuary workers.<sup>10</sup> Similarly, Mittal in India also found that as much as 60% of the workplace injuries when handling corpses were needle stick or sharps injuries.<sup>9</sup>

### **Establishment of embalmer's school**

Another recurring theme found in this study is the lack of attention given to continuous training of workers. All three aspects of this study showed that most of the mortuary workers had not received any training after they began their careers. Several studies have highlighted the positive impact of continuous education in ensuring that best practices are adhered to.<sup>5,8,14</sup> Other benefits of continuous training include ensuring that health workers are kept abreast of modern developments in their professions and improving worker morale.<sup>15</sup> However, among the few workers in this study who had some form of training, it was observed that specialized training such as handling HIV positive corpses or handling corpses during outbreak of deadly epidemics was common. This finding is similar to that of Bakhshi who reported that most workers were likely to receive continuous policy directions in relation to handling corpses that present a quantifiable risk of transmitting deadly diseases.<sup>12</sup>

Among the diseases that mortuary workers felt that they were exposed to, Ebola ranked high with hepatitis B was among the lowest. However, other studies have consistently shown that mishandling of corpses results in a significant increase in the likelihood of contracting hepatitis B, with 2 million health workers being exposed to hepatitis B virus.<sup>11,14</sup> Similarly, a sero-survey of 133 embalmers in an urban area in the United States showed the sero-positivity rate of hepatitis B virus (13%) was twice that of a blood donor comparison group.<sup>13</sup> The difference between the perception of mortuary workers about their exposure to diseases such as hepatitis B and the reality of their exposure may result in reduced adherence of guidelines that are meant to protect them.

The lack of testing and treatment services by the facility management in many cases in this study indicates is another theme that shone through all three aspects of the study. This situation is similar to findings by Okoth-Okelloh in Kenya where most of the workers had no provision for treatment made for mortuary workers.<sup>16</sup> In the light of the increased occupational risk of mortuary earlier described, the absence of treatment services by the management also serves to undermine adherence to safety practices and could negatively impact worker morale.

### **CONCLUSION**

Morticians are continually exposed to workplace injuries and infections while embalming dead bodies. Increased vulnerability of morticians to infections and injuries stem from the lack of trainings prior to the commencement of embalming practice. Also, the reduced use of PPE such as goggles accounted for the increased exposure of the eyes to splash of embalming fluid. In some instances, care was provided to injured morticians by the management of their work places, however there were also instances of injured morticians bearing the brunt of their treatment expenses. We therefore recommend that trainings are

organized by the professional bodies of morticians prior to the issuance of certificates of practice to morticians. Also, communication on the adherence to the use of PPE among morticians should be adequately communicated. In addition, occupational safety should be mandated for all health facilities where embalming practices are being conducted. Also, all medical expenses incurred following the treatment of injured morticians while discharging their duties should be entirely borne by the health facilities.

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