

A comparative study of the common health and safety complaints among laundry workers in secondary and tertiary health facilities in Nigeria

EmmanuelNosa Omoijiade^{1*}, Oladapo Titus Okareh¹

¹ (Department of Environmental Health Sciences, College of Medicine, University of Ibadan, Nigeria)

Abstract: The most common accidents in industrial laundries involve chemical exposure, sharp objects left in soiled linen, slips from wet floors, exposure to pathogens in contaminated linen, among others. This study sought to provide information on the common health and safety complaints among laundry workers in tertiary and secondary health facilities, as this would prove useful in order to establish appropriate interventions. It was a comparative cross-sectional study, conducted in six hospitals with a laundry department in Benin-city, composed of one available tertiary healthcare facility and five secondary healthcare facilities. Questionnaires were administered to the workers to obtain data on their work-related injuries and diseases. Also, body mapping exercise was conducted to obtain workers' health information resulting from exposures to ergonomic hazards. The common workplace injuries or illnesses reported were sharps injury (20%), musculoskeletal pain (92%), hearing disorder (4%), burns (8%), electric shocks (6%), slips, trips, or falls (28%) and cuts or bruises (18%). The most common musculoskeletal complaints were that of the lower back (74%), shoulders (42%), upper back (34%), and knee (34%). Hospital laundry workers in both secondary and tertiary health facilities alike suffered from various adverse health and safety conditions due to exposure to occupational hazards in the workplace.

Keywords: health and safety, accidents, injuries, hospital laundry, health facilities, laundry workers

Date of Submission: 03-05-2018

Date of acceptance: 18-05-2018

I. Introduction

Healthcare workers (HCW) are exposed to various occupational hazards that may threaten their health and safety [1], however, exposure to hazardous agents depends upon the job category and the work environment of the HCW [2].

Occupational safety and health (OSH) hazards in healthcare facilities can be grouped geographically or according to location or service offered. In the laundry department, they include; contaminated laundry, noise, heat, lifting, sharps, slips, trips, falls and fire hazards [3].

Occupational hazards in the laundry environment are numerous. The most common accidents in industrial laundries involve chemical exposure, sharp objects left in soiled linen, slips from wet floors, exposure to pathogens in contaminated linen, among others [4].

Of all the potential hazards in the healthcare laundry environment, sharps injuries and bloodborne pathogen exposures can be some of the most injurious to workers in terms of long-term treatment required [4].

A study conducted by Borg and Portelli in Manila, suggested that continuous exposure to contaminated hospital linen may cause a significant rise in the possibility of infection with hepatitis A [5] and was supported after a study carried out by Keeffe [6]. An estimated 20 to 40% of healthcare-associated infections (HAIs) have been attributed to cross-infection via the hands of health care workers (HCWs), who have become contaminated from direct contact with the patient or indirectly by touching contaminated hospital environmental surfaces [7]. Orji et. al. opined that needle stick injuries were the commonest occupational health hazard reported from a Nigerian teaching hospital [8]. World Health Organization (WHO) estimated that there are approximately 3 million cases of needle stick injury (NSI) in healthcare workers each year, with 90% of these occurring in developing countries, resulting in 40% of hepatitis B and C cases among HCWs worldwide [9].

Adverse effects of cleaning products on skin, such as occupational hand dermatitis, have also been reported by some studies on hospital cleaning workers [10-12]. Results from epidemiological investigations support the hypothesis that exposure to cleaning products is related to the development and/or exacerbation of respiratory symptoms, including asthma [13-20]. Findings from some studies have shown that bleach can be responsible for asthma symptoms among domestic cleaners [17,21]. Complexing agents (substances capable of forming a complex compound with another material in solution) such as EDTA (Ethylene Diamine Tetra Acetic Acid) can cause eye or skin irritation.

Physical hazards in the general working environment that are also encountered in the hospital environment include temperature, illumination, noise, vibration, slips, trips and falls, changes in atmospheric pressure, and ionizing and non-ionizing radiation [22-28].

Occupational noise is present in hospitals, mainly in hospital laundries where continuous exposition to high levels of sound pressure may bring about permanent changes in workers' hearing threshold. In a research held at the Clinicas Hospital of Medical School from Universidade Federal de Goiás, the mapping of hospital noise evidenced averaged 75dB in all hospital settings, and in the laundry, the noise level found was 91dB in the morning period and 90dB in the evening period. The authors verified that 31.4% of the workers presented characteristic audiometries for NIHL [29].

Laundry workers are also at risk of musculoskeletal disorders [30]. Laundry workers spend long periods on their feet, and are regularly required to lift heavy loads [31]. Muslim et. al showed in a research that in every single activity of laundry workers in Indonesia, the positions were not ergonomic [32]. Based on the posture assessment in her research, she concluded that there is need for improvement in the laundry workers' posture. The workers complained primarily of pains in the waist and arm.

Tasks carried out by workers in the laundry of a large general hospital put them at risk of lower back and shoulders injuries. The tasks included a combination of excessive forward bending to lift dry and wet linen, forceful exertion, and work in awkward postures [33].

According to Tseko and Pilane, occupational related HIV transmission among healthcare workers results mostly from needle pricks, blood and body fluid splashes [34]. World Health Organization reports that among the 35 million health workers worldwide, about 3 million sustain percutaneous exposures via needle-stick injuries to blood borne pathogens each year, including 2 million to hepatitis B virus (HBV), 0.9 million to hepatitis C virus (HCV) and 170,000 to human immune deficiency virus (HIV) [7]. This study sought to provide information on the common health and safety complaints among laundry workers in tertiary and secondary health facilities, as this would prove useful in order to establish appropriate interventions.

The objectives of this study were to assess the common health complaints, accidents and injuries of hospital laundry workers, as well as to make a comparison among the different hospital categories in the Benin metropolis.

II. Methodology

2.1. Study design

This study was a comparative cross-sectional study.

2.2. Geographical location of study area

Benin City, the capital of Edo State, has a land area of 1,219.626km² and is bounded by latitude 6°20'North and longitude 5°39' East.

2.3. Study area

The study was conducted in hospitals with a laundry department, including the University of Benin Teaching Hospital (UBTH), Central Hospital Benin (CHB), Stella Obasanjo Hospital (SOH), St. Philomena Catholic Hospital (SPCH), Faith Medical Complex (FMC) and Ihenyen Hospital (IH), all in Benin-City.

The University of Benin Teaching Hospital, Benin-city is a federal tertiary health facility located on the Benin-Lagos expressway with coordinate 6.3337°N 5.60002°E. It came into being in 1973 and boast facilities to accommodate over 500 in-patients.

The other hospitals included in the study, that is, Central Hospital Benin, Stella Obasanjo Hospital, St. Philomena Catholic Hospital, Faith Medical Complex and Ihenyen Hospital, are secondary care health facilities which provide a wide range of healthcare services.

2.4. Study population

The study was carried out among laundry workers in the health facilities. A minimum sample size of 42 respondents per group was required as calculated using the formula for sample size estimation of two proportions below:

$$N = \frac{(Z_a + Z_b)^2 (p_1 q_1 + p_2 q_2)}{(p_1 - p_2)^2}$$

Where; N=sample size per group,

P=proportion of the attribute,

q=complement of 'p',

Z_a=1.96 (95% confidence level),

Z_b=0.84 (80% power),

P₁=0.646 [43], and

P₂=0.342 [44].

Therefore, a total of 84 respondents was required for this study, however, due to limited population size, sampling was not carried out, as the total population was used in the study.

As presented in Table 1, of the 54 respondents eligible to participate in the study, only 50 were present and consented to participate in the study; a response rate of 92.6 %.

Inclusion criterion

- Hospital laundry workers who consented to participate in the study.

Exclusion criteria

- Hospital laundry workers who could not be met at the workplace or did not consent to participate in the study.
- Workers in the tailoring unit of the laundry department.

Table 1: Characteristics of the Health Facilities Studied

S/N	Ownership	Type of health facility	Number of laundry workers	Number of respondents
1	Government	Tertiary	35	31
2	Government	Secondary	3	3
3	Government	Secondary	2	2
4	Private	Secondary	6	6
5	Private	Secondary	4	4
6	Private	Secondary	4	4
TOTAL			54	50

2.5. Data collection and instruments

Data was collected via survey. A semi-structured questionnaire was issued to the hospital laundry workers which provided data on work-related injuries and health complaints. The content of the questionnaire included; socio-demographic information, occupational information, and health information. Also, a body mapping exercise was adapted from a DHHS-NIOSH publication [37] and used to obtain the health information of the study participants as a result of exposure to ergonomic hazards. It provided information on; body part(s) with pain or discomfort, level of pain or discomfort, and duration of episodes. For respondents who were not literate, data was collected via interviews.

2.6. Data management and analysis

Statistical package for social science version 20 (SPSS 20) was used for data entry, management and analysis. From the data gathered with the questionnaire, descriptive statistics was used to summarize data on the socio-demographic characteristics, as well as on the common health complaints of the workers, using frequency tables, bar graphs and pie charts.

Also, chi-square analysis was used to check for a relationship between common health complaints and health facility indices. A confidence level of 95% was used, so that a P-value less than 0.05 ($P < 0.05$) resulted in the rejection of the null hypothesis, thereby stating a significant relationship between the variables tested.

2.7. Ethical considerations

Ethical approval was obtained from the University of Benin Teaching Hospital (UBTH) ethical committee, the State Hospital Management Board, ring-road, Benin-city, as well as from the administrators of all the private hospitals included in the study.

Furthermore, informed consent was obtained from laundry workers who participated in the study, after they were duly informed on all the processes involved in the research before the commencement. Also, the confidentiality of participants' identities was maintained, as survey questionnaires did not require participants to provide information on their identity. There was no maleficence from participants in this study as every participant was treated equally.

III. Results

3.1. Socio-demographic characteristics of respondents

As presented in Table 2, the study population was largely female (60%). The mean age (SD) of respondents was 47.66 ± 11.19 years, while 13 respondents (26%) were between 41 and 50 years. Among the various hospital categories, the government tertiary had more males (54.8%) than females (45.2%), whereas respondents in the private secondary (28.6%) and government secondary (40%) had most of their respondents between the ages of 51 and 60 years.

The study revealed that there was an association between the sex of respondents and the health facility types ($p=0.006$) and hospital categories ($p=0.023$) as presented in Table 3. Furthermore, there was no significant

difference in the age of respondents between the health facility types (p=0.285) and among the hospital categories (p=0.324) as presented in Table 4 and Table 5 respectively.

In this study, most respondents had up to secondary school education (40%). Among the various hospital categories, most of the respondents in private secondary (35.7%) and government secondary (40%) had up to primary school education. This is presented in Table 2.

As presented in Table 3, a P-value of 0.15 which showed no association was observed between educational qualification and hospital categories, but the P-value dropped to 0.025, which shows an association when educational qualification was compared between the types of health facilities.

In addition, the respondents had an average of 8.48 ± 7.72 years of work experience in hospital laundry, although, most respondents (50%) had worked in the hospital laundry for less than 5 years and were employed on a permanent basis (82%). Among the various hospital categories, most of the respondents in government tertiary (35.5%) had worked in the hospital laundry for 5 to 10 years, whereas, most of the respondents in government secondary (80%) were employed on a contract basis. This is presented in Table 2.

The study further revealed that there was a statistically significant difference in length of work experience between the health facility types (p=0.024) and among the various hospital categories (p=0.021), as presented in Table 4 and Table 5 respectively. Moreover, a P-value of 0.66 which showed no association was observed between mode of employment and health facility type, but the P-value dropped to 0.00, which shows an association when mode of employment was compared among the various hospital categories, as presented in Table 3.

Table 2: Socio-demographic Characteristics of Respondents

Description of variables	PS		GS		GT		Total	
	n	%	n	%	n	%	n	%
Age range of respondents								
=<30 yrs	2	14.3	0	0	2	6.5	4	8.0
31-40 yrs	2	14.3	1	20.0	9	29.0	12	24.0
41-50 yrs	3	21.4	1	20.0	9	29.0	13	26.0
51-60 yrs	4	28.6	2	40.0	7	22.6	13	26.0
>60 yrs	3	21.4	1	20.0	4	12.9	8	16.0
Mean age \pm S.D.	48.21 \pm 12.50		54.40 \pm 10.16		46.32 \pm 10.65		47.66 \pm 11.19	
Sex of respondents								
Male	2	14.3	1	20.0	17	54.8	20	40.0
Female	12	85.7	4	80.0	14	45.2	30	60.0
Educational Qualification								
None	5	35.7	2	40.0	2	6.5	9	18.0
Primary	5	35.7	2	40.0	11	35.5	18	36.0
Secondary	4	28.6	1	20.0	15	48.4	20	40.0
Tertiary	0	0	0	0	3	9.7	3	6.0
Years of working experience in hospital laundry								
=<5 yrs	11	78.6	4	80.0	10	32.3	25	50.0
5-10 yrs	3	21.4	0	0	11	35.5	14	28.0
11-15 yrs	0	0	0	0	2	6.5	2	4.0
15-20 yrs	0	0	0	0	5	16.1	5	10.0
>20 yrs	0	0	1	20.0	3	9.7	4	8.0
Mean \pm S.D.	3.71 \pm 2.525		10.00 \pm 14.00		10.39 \pm 7.32		8.48 \pm 7.72	
Mode of employment								
Permanent	14	100	1	20.0	26	83.9	41	82.0
Contract	0	0	4	80.0	5	16.1	9	18.0

KEY: PS=Private Secondary

GS=Government Secondary

GT=Government Tertiary

Table 3: Measure of association among health facility indices and socio-demographic characteristics

Description of variables	Type of health facility		Hospital category	
	X ²	P-value	X ²	P-value
Sex of respondents	7.484	0.006	7.535	0.023
Educational qualification	9.324	0.025	9.448	0.150
Mode of employment	0.193	0.660	16.168	0.000

Table 4: Independent samples T-test of socio-demographic characteristics between health facility types

Description of variables	T	P-value	95% Confidence Interval of the Difference	
			Lower	Upper
Age of respondents	1.082	0.285	-3.023	10.062
Years of work experience in hospital laundry	-2.331	0.024	-9.348	-0.689

Table 5: ANOVA of Socio-demographic Characteristics among the Various Hospital Categories

Description of variables	F	P-value
Age of respondents	1.153	0.324
Years of work experience in hospital laundry	4.197	0.021

3.2. Job tasks undertaken by the respondents

As presented in Fig. 1, labelling of clean laundry for delivery was carried out by only 2 (4%) respondents, who are actually in the tertiary health facility, as labelling is not carried out in the secondary health facilities. Furthermore, few number of respondents (28%) were involved in ironing of laundry, while most respondents were involved in sorting (92%), folding (78%), collecting (76%) and delivering (76%) of laundry, as presented in Fig. 1.

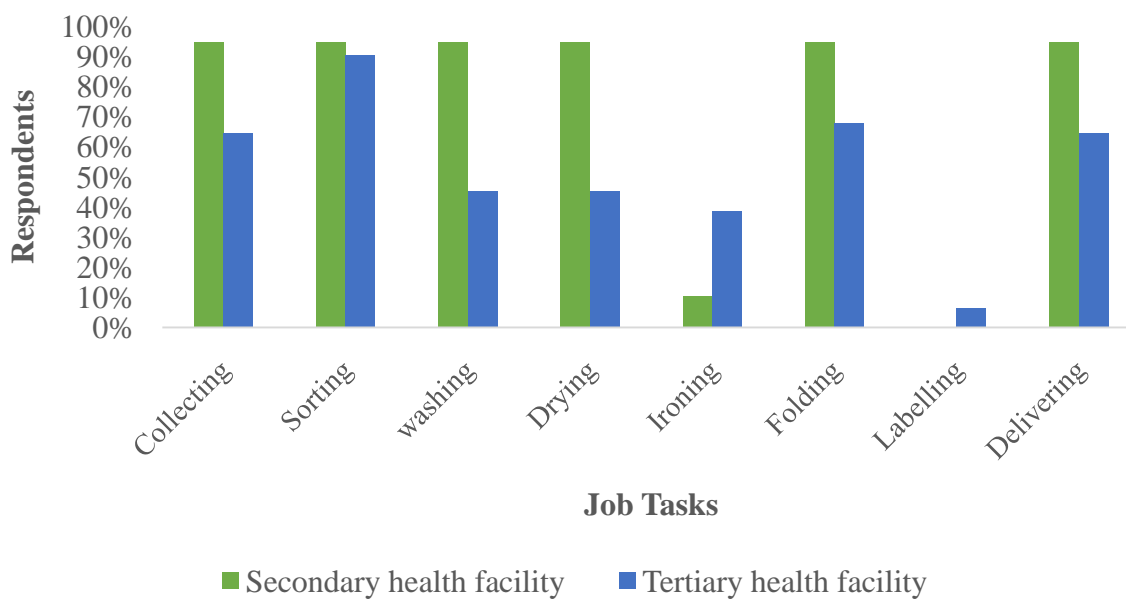


Figure 1: Job tasks undertaken by the respondents

3.3. Common health complaints, accidents and injuries of respondents

Respondents (20%) reported that they had had at least one needle stick injury while carrying out their job tasks in the past year (Fig. 2). However, among the various hospital categories, none of the respondents in private secondary, 60% of those in government secondary and 22.6% of those in government tertiary hospital reported that they had had at least one needle stick injury in the past year. No association between sharps injury and health facility type was observed ($p=0.560$), however, there was an observed association between sharps injury among the various hospital categories ($p=0.013$) (Table 6).

Respondents (92%) reported that they had had musculoskeletal pains in at least one part of their body while carrying out their job tasks in the past year, as presented in Fig. 2. While all the respondents in the government secondary hospitals reported that they had had musculoskeletal pains in at least one part of their body in the past year, only 90.3% of respondents in the government tertiary and 92.9% of respondents in the private secondary hospitals reported so. No association between musculoskeletal pains and health facility types ($p=0.577$) and hospital categories ($p=0.753$) was observed, as presented in Table 6.

As presented in Fig. 2, only 6.5% of respondents in the government tertiary hospital reported that they had had hearing pains or disorder while carrying out their job tasks in the past year, with no observed association between hearing pains or disorder and health facility types ($p=0.258$) and hospital categories ($p=0.528$) (Table 6).

Respondents (8%) reported that they had had burns while carrying out their job tasks in the past year (Fig. 2). While none of the respondents in private secondary reported that they had had burns in the past year, 9.7% of respondents in the government tertiary and 20% of those in the government secondary hospitals reported so. As presented in Table 6, no association between burns and hospital facility types ($p=0.577$) and hospital categories ($p=0.314$) was observed.

As presented in Fig. 2, only 9.7% of respondents in the government tertiary hospital reported that they had had electric shocks while carrying out their job tasks in the past year, with no observed association between electrical shocks and health facility types ($p=0.162$) and hospital categories ($p=0.376$) (Table 6).

Respondents (28%) reported that they had slipped, tripped or fallen while carrying out their job tasks in the past year (Fig. 2). While all the respondents in the government secondary hospitals reported that they had slipped, tripped or fallen in the past year, only 12.9% of respondents in the government tertiary and 35.7% of respondents in the private secondary hospitals reported so. As presented in Table 6, an association between slips, trips or falls and health facility types ($p=0.002$) and hospital categories ($p=0.000$) was observed.

Only 29% of respondents in the government tertiary hospital reported that they had had cuts or bruises while carrying out their job tasks in the past year (Fig. 2), with an observed association between cuts or bruises and health facility types ($p=0.009$) and hospital categories ($p=0.035$) (Table 6).

All of the respondents reported that they had neither had hand dermatitis nor breathing difficulty or asthmatic symptoms while carrying out their job tasks in the past year.

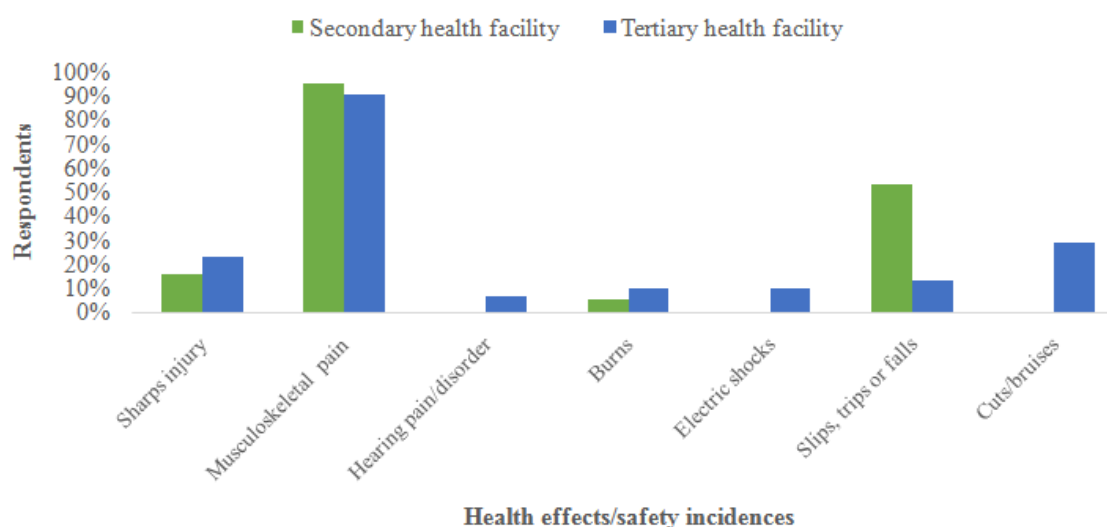


Figure 2: Common health complaints, accidents and injuries of respondents

Table 6: Measure of Association among Health Facility Indices and Common Health Complaints, Accidents and Injuries

Description of variables	Type of health facility		Hospital category	
	X ²	P-value	X ²	P-value
Sharps injury	0.340	0.560	8.629	0.013
Musculoskeletal pain	0.312	0.577	0.567	0.753
Hearing pain or disorder	1.277	0.258	1.277	0.528
Burns	0.312	0.577	2.314	0.314
Electric shocks	1.956	0.162	1.956	0.376
Slips, trips or falls	9.223	0.002	16.775	0.000
Cuts/bruises	6.727	0.009	6.727	0.035

3.4. Musculoskeletal complaints and severity of pain among respondents

Respondents (26%) reported that they suffered from pains in the neck region while carrying out their job tasks (Fig.3). However among the various hospital categories, 28.6% of the respondents in private secondary, 80% of those in government secondary and 16.1% of those in government tertiary hospital reported so. There was an observed association between pains in the neck region and health facility type ($p=0.042$), as well as among the various hospital categories ($p=0.010$) (Table 7).

Respondents (42%) reported that they suffered from pains in the shoulder region while carrying out their job tasks (Fig.3). While 85.7% of respondents in the private secondary and 60% of respondents in the government secondary hospitals reported that they suffered from pains in the shoulder region while carrying out their job tasks, only 19.3% of respondents in the government tertiary hospitals reported so. An association between pains in the shoulder region and health facility indices ($p=0.000$) was observed (Table 7).

Respondents (34%) reported that they suffered from pains in the upper back region while carrying out their job tasks (Fig.3). However among the various hospital categories, 50% of the respondents in private secondary, 20% of those in government secondary and 29% of those in government tertiary hospital reported so. There was no observed association between pains in the upper back region and health facility type ($p=0.344$), as well as among the various hospital categories ($p=0.305$) (Table 7).

Respondents (18%) reported that they suffered from pains in the elbow/fore arm region while carrying out their job tasks (Fig.3). Among the various hospital categories, 14.3% of respondents in the private secondary, 40% of respondents in the government secondary and 16.1% of respondents in the government tertiary hospitals reported that they suffered from pains in the elbow/fore arm region while carrying out their job tasks. No association was observed between pains in the elbow/fore arm region and health facility type ($p=0.660$), as well as among the various hospital categories ($p=0.398$) (Table 7).

Respondents (20%) reported that they suffered from pains in the wrist/hand region while carrying out their job tasks (Fig.3). However among the various hospital categories, 14.3% of the respondents in private secondary, 80% of those in government secondary and 12.9% of those in government tertiary hospital reported so. There was no observed association between pains in the wrist/hand region and health facility type ($p=0.109$), whereas an association was observed among the various hospital categories ($p=0.002$) (Table 7).

Respondents (18%) reported that they suffered from pains in the fingers while carrying out their job tasks (Fig. 3). Among the various hospital categories, 14.3% of respondents in the private secondary, 80% of respondents in the government secondary and 9.7% of respondents in the government tertiary hospitals reported that they suffered from pains in the fingers while carrying out their job tasks. There was no observed association between pains in the fingers and health facility type ($p=0.050$), whereas an association was observed among the various hospital categories ($p=0.001$) (Table 7).

Respondents (74%) reported that they suffered from pains in the lower back region while carrying out their job tasks (Fig.3). However among the various hospital categories, 85.7% of the respondents in private secondary, all of those in government secondary and 64.5% of those in government tertiary hospital reported so. There was no observed association between pains in the lower back region and health facility type ($p=0.051$), as well as among the various hospital categories ($p=0.122$) (Table 7).

Only 19.3% of respondents in the government tertiary hospitals reported that they suffered from pains in the hip/thigh region while carrying out their job tasks (Fig.3). There was an observed association between pains in the hip/thigh region and health facility type ($p=0.041$), whereas no association was observed among the various hospital categories ($p=0.124$) (Table 7).

Respondents (34%) reported that they suffered from pains in the knee region while carrying out their job tasks (Fig.3). However among the various hospital categories, 38.6% of the respondents in private secondary, 80% of those in government secondary and 29% of those in government tertiary hospital reported so. There was no observed association between pains in the knee region and health facility type ($p=0.344$), as well as among the various hospital categories ($p=0.073$) (Table 7).

Respondents (32%) reported that they suffered from pains in the ankle/foot region while carrying out their job tasks (Fig.3). Among the various hospital categories, 28.6% of respondents in the private secondary, 80% of respondents in the government secondary and 25.8% of respondents in the government tertiary hospitals reported that they suffered from pains in the ankle/foot region while carrying out their job tasks. No association was observed between pains in the ankle/foot region and health facility type ($p=0.230$), as well as among the various hospital categories ($p=0.052$) (Table 7).

Majority of all respondents (28.3%) reported that each episode lasted two to three days (Fig.4). However, among the various hospital categories, 38.5% of respondents in the private secondary, 20% of respondents in the government secondary and 25% of respondents in the government tertiary hospitals reported so.

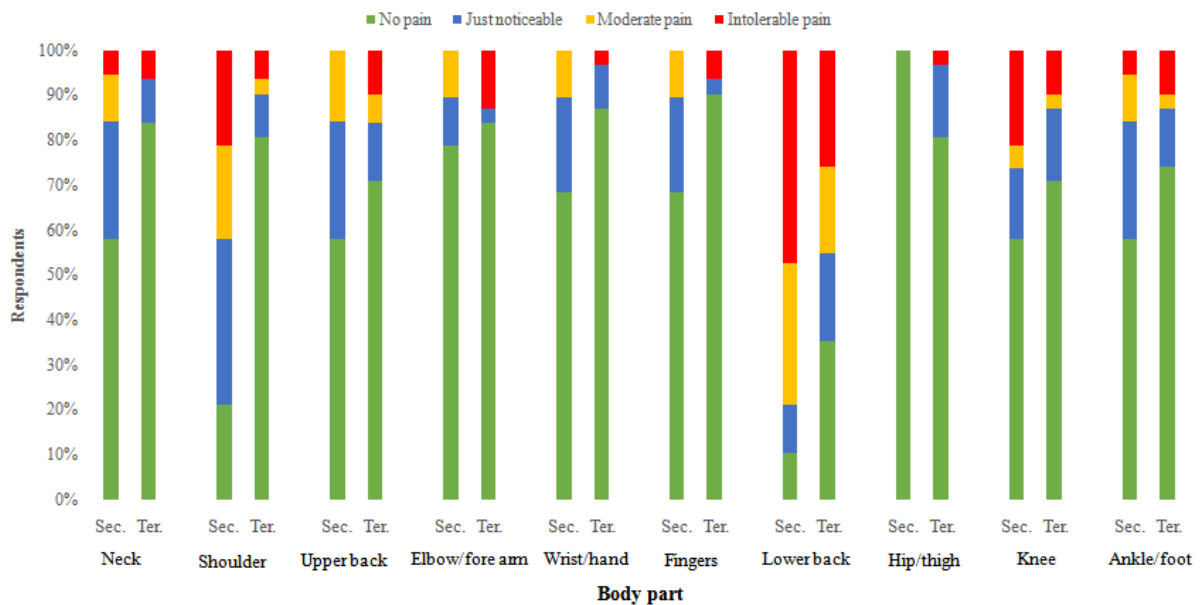


Figure 3: Musculoskeletal complaints and severity of pain among respondents

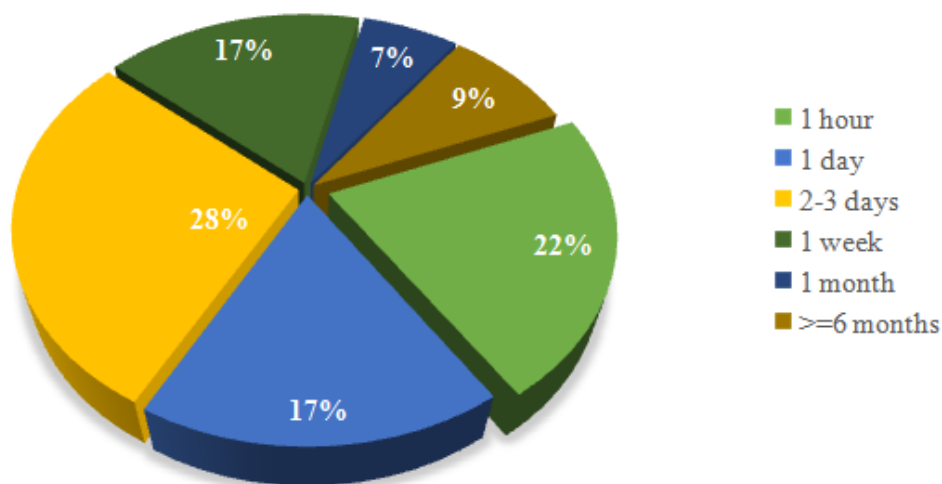


Figure 4: Length of each episode of musculoskeletal pain

Table 7: Measure of Association among Health Facility Indices and Presence of Musculoskeletal Complaints

Body Area	Type of health facility		Hospital category	
	X ²	P-value	X ²	P-value
Neck	4.131	0.042	9.196	0.010
Shoulder	17.173	0.000	18.173	0.000
Upper Back	0.897	0.344	2.375	0.305
Elbow/Fore Arm	0.193	0.660	1.844	0.398
Wrist/Hand	2.568	0.109	12.512	0.002
Fingers	3.828	0.050	14.607	0.001
Lower Back	3.814	0.051	4.204	0.122
Hip/Thigh	4.179	0.041	4.179	0.124
Knee	0.897	0.344	5.240	0.073
Ankle/Foot	1.438	0.230	5.916	0.052

3.5. Other health-related information

Respondents (76%) reported that they underwent a pre-employment medical examination, however among the various hospital categories, 64.3% of the respondents in private secondary, 60% of those in government secondary and 83.9% of those in government tertiary hospital reported so (Table 8).

Respondents (38%) reported that they were transferred from another department to the laundry department, including, 35.7% of the respondents in private secondary and 45.2% of those in government tertiary hospitals, however, they all reported that they did not undergo any medical examination prior to their transfer to the laundry department (Table 8).

Majority (56%) of all the respondents reported that they did not know if they had been immunized against hepatitis, including, 71% of respondents in the government tertiary hospital. However, 71.4% of respondents in private secondary and 60% of those in government secondary hospitals reported that they had not been immunized against hepatitis. Only 9.7% of respondents in the government tertiary hospital affirmed that they had been immunized against hepatitis (Table 8).

Majority (96%) of all the respondents reported that they did not have routine medical check-ups, while 54% of all respondents had visited a medical centre in less than six months, with illness reported as the purpose of these medical visits (89.7%) (Table 8).

Respondents (84%) who have had one or more workplace accidents and injuries did not report any of them to the supervisor or administrator, including, all the respondents in private secondary, 80% of those in government secondary and 80% of those government tertiary hospitals, citing necessity as the major reason (87%) for failure to report workplace accidents and injuries (Table 8).

Table 8: Other Health-related Information

Description of variables	PS		GS		GT		Total	
	n	%	n	%	n	%	n	%
Pre-employment medical examination								
No	5	35.7	2	40.0	5	16.1	12	24.0
Yes	9	64.3	3	60.0	26	83.9	38	76.0
Transferred to laundry department								
No	9	64.3	5	100	17	54.8	31	62.0
Yes	5	35.7	0	0	14	45.2	19	38.0
Medical examination prior to transfer								
No	5	100	-	-	14	100	19	100
Hepatitis immunization								
No	10	71.4	3	60.0	6	19.4	19	38.0
Yes	0	0	0	0	3	9.7	3	6.0
Do not know	4	28.6	2	40.0	22	71.0	28	56.0
Routine medical checks								
None	14	100	3	60.0	31	100	48	96.0
Monthly	0	0	1	20.0	0	0	1	2.0
Quarterly	0	0	1	20.0	0	0	1	2.0
Latest medical centre visit								
<6 months	12	85.7	3	60.0	12	38.7	27	54.0
6 months-1 year	2	14.3	1	20.0	5	16.1	8	16.0
1-3 years	0	0	0	0	4	12.9	4	8.0
Cannot remember	0	0	1	20.0	10	32.3	11	22.0
Purpose of medical visit								
Routine medical check	1	7.1	1	25.0	2	9.5	4	10.3
Illness	13	92.9	3	75.0	19	90.5	35	89.7
Accidents/injuries reporting								
Never	5	100	4	80.0	12	80.0	21	84.0
Sometimes	0	0	1	20.0	1	6.7	2	8.0
Always	0	0	0	0	2	13.3	2	8.0
Reason for not reporting accidents/injuries								
Not necessary	5	100	4	80.0	11	84.6	20	87.0
Not available	0	0	1	20.0	1	7.7	2	8.7
Reports not considered	0	0	0	0	1	7.7	1	4.3

KEY:PS=Private Secondary
GS=Government Secondary

GT=Government Tertiary

IV. Discussion

4.1. Socio-demographic characteristics of respondents

Although the study population was largely female, however the male to female ratio among respondents in the tertiary health facility was almost equal as opposed to respondents in secondary health facilities, where respondents included more females than males. The reason for the equal male to female ratio in the tertiary health facility may be as a result of the complexities in the laundry department, which makes some tasks more suited for females to carry out, and others more suited for the males to carry out, hence, a division of labour. However, females are more in number than males in the secondary health facility because the laundry operation is basically done manually, with females believed to wash better than males, leaving the males to carrying out only the tasks of ironing and supervising.

This observation is in contrast with those of Kumar et al. who observed that workers studied in the laundry department of a tertiary health facility comprised mostly males than females, stating that the difference was because the activities in the Laundry Department demanded more physical activity such as lifting clothes, pushing linen in trolleys, and handling machines [38].

Respondents in the tertiary health facility were more educated than those in the secondary and this may as a result of the washing process in the laundry, which is basically mechanised in the tertiary health facility, as opposed to the secondary health facility, where it is basically carried out manually.

Also, respondents in the tertiary health facility were observed to have worked in the hospital laundry longer and thus have more work experience than those in the secondary health facility.

4.2. Job tasks undertaken by the respondents

It was observed that almost all of the workers in the secondary health facility were involved in all the job tasks, except ironing of laundry, which was only carried out by the males, however, in the tertiary health facility, there seemed to be a form of division of labour, as a group of workers carried out a set of tasks as opposed to all of the workers carrying out all the different job tasks.

4.3. Common health complaints, accidents and injuries of respondents

A number of respondents reported that they had had at least one needle stick injury while carrying out their job tasks in the past year, with no difference observed between reports from secondary and tertiary health facilities. Hence, sharps injuries is still a major concern for healthcare workers in both secondary and tertiary hospital laundries alike. This is similar to report by Steed and Lettau who observed that overall, 39% of hospital laundry workers had a history of at least one prior sharp injury [39].

Almost all of the respondents in secondary and tertiary health facilities alike reported that they had had musculoskeletal pains in at least one part of their body while carrying out their job tasks in the past year. This is as a result of repeatedly bending and extending of the back, squatting, stretching, and extending of the arms as well as other various body movements involved in the laundry operation, as was also previously observed by Kumar et al. [38].

Only few respondents in the secondary and tertiary health facilities alike reported that they had had burns, electric shocks and hearing pains or disorder while carrying out their job tasks in the past year. In a report by Fontoura et al., tinnitus was reported by 29.47% [40]. Also, literature including Lopes et al. and Steinmetz et al. noted that tinnitus is a common symptom for those who work in noisy settings such as laundries [41,42]. Furthermore, Hasselhorn et al. had previously noted that workers in laundry rooms are among the main groups that are exposed to heat-related hazard in a hospital setting [22].

A number of respondents in the tertiary health facility reported that they had had cuts or bruises while carrying out their job tasks in the past year, unlike those in the secondary health facility who all reported otherwise. This is as a result of the use of metal trolleys in the tertiary health facility for the transportation of laundry from the wards and operating theatre to the laundry room and back.

Over half of the respondents in the secondary health facility reported that they had slipped, tripped or fallen while carrying out their job tasks in the past year, unlike respondents in the tertiary health facility, where only a few of them reported so. This is similar to a report by Imam et al. who noted that 61.5% of support workers (non-health service providers) reported that the aisles and floors were in good condition and 53.8% reported they were slippery [43].

In general, these findings are similar to those of Pyrek who noted that the most common accidents in industrial laundries involve chemical exposure, sharp objects left in soiled linen, slips from wet floors, exposure to pathogens in contaminated linen, among others [4], while Sukumar and Karthiga noted in their research among laundry workers that the majority of the respondents are affected by musculoskeletal disorder, slips from wet floors, chemical infections, and small scratch/bruise among others [31].

4.4. Musculoskeletal complaints and severity of pain among respondents

Among the respondents in secondary health facility, the major musculoskeletal complaints in decreasing frequency were lower back and shoulder, followed by neck, upper back, knee and foot, whereas among the respondents in the tertiary health facility, the major musculoskeletal complaint was lower back, followed by those of the upper back and knee. In general, the respondents in the secondary health facility had a greater percentage of musculoskeletal complaints for all the body parts, except the hip/thigh region, where the percentage of complaints were higher among those in the tertiary health facility.

Also, majority of all respondents reported that each episode lasted two to three days, similar to reports by Ekawati, who further noted in his research that the most common complaints are of the upper body [44].

4.5. Other health-related information

Majority of all the respondents reported that they underwent a pre-employment medical examination. However, as opposed to requirement by WHO [7], not all of the workers were examined before employment. Furthermore, all of the respondents who were transferred from another department to the laundry reported that they did not undergo any medical examination prior to the transfer.

About half of all the respondents reported that they did not know if they had been immunized against hepatitis. Only a few respondents from the tertiary health facility affirmed that they had been immunized against hepatitis. This is in contrast to a similar study carried out in a tertiary health facility which reported that all respondents were vaccinated against hepatitis B [45].

Almost all of the respondents reported that they did not have routine medical check-ups, while about half of all respondents had visited a medical centre in less than six months. This is in sharp contrast with a study by Kumar et al., who reported that all the laundry workers did have a periodic health appraisal during which they were examined and referred to respective specialties for free consultations [38].

Almost all of the respondents who have had one or more workplace accidents and injuries did not report any of them to the supervisor or administrator with majority of them of the opinion that it was unnecessary. However, Pyrek noted that a recommended step in ensuring a safer workplace includes encouraging reporting and elimination of workplace hazards. He further noted that this involves creating a blame-free environment for reporting injuries/accidents and injury hazards, explaining that healthcare personnel who know that management will discuss problems in an open and blame-free manner are more likely to report hazards [4].

V. Conclusion and recommendations

The most common workplace injuries or illnesses reported by the hospital laundry workers were sharps injury, musculoskeletal pain, hearing disorder, burns, electric shocks, slips, trips, or falls, and cuts or bruises.

Based on findings from this study, it is recommended that secondary health facilities employ a division-of-labour system, rather than requiring all the workers to carry out all the different job tasks, as this would reduce the number of workers exposed to the hazards inherent in each job task. Laundry workers should also be given regular education sessions to strengthen awareness on the occupational health and safety risks associated with their occupation, while encouraging them to report workplace incidents and injuries as well as work-related illnesses.

Furthermore, healthcare laundry workers should be required to undergo pre-employment medical examination as well as regular medical checks, while workers transferred from other departments to laundry department should also undergo medical examination. Also, it should be ensured that all of the laundry workers are immunized against hepatitis.

References

- [1]. J.M. Harrington, F.S. Gill, T.C. Aw, G. Applebey, and C.P. Atwell, *Occupational health, 4th ed.* (Oxford (UK): Blackwell Pup, 2000, p.3-347).
- [2]. M.B. Russi, and M.V. Howarth, Occupational medicine in health care industry, in *Text Book of Clinical Occupational and Environmental Medicine, 2nd ed.*, (USA: Elsevier Inc., 2005) p. 245
- [3]. World Health Organization (WHO), Health worker occupational health, in WHO (Ed.) *Occupational Health - Health workers, vol. 2012*, (WHO, Geneva, 2010).
- [4]. K.M. Pyrek, *Infection Control Today: Preventing Sharps Injuries and Blood-borne Pathogen Exposures in the Healthcare Laundry*, Informa Exhibitions LLC, 2015.
- [5]. M.A. Borg, and A. Portelli, Hospital laundry workers — an at-risk group for hepatitis A, *Occup Med (Lond)*, 49, 1999, 448-50.
- [6]. E.B. Keeffe, Occupational risk for hepatitis A: A literature-based analysis, *J. Clin. Gastroenterol.*, 38, 2004, 440-448
- [7]. World Health Organization (WHO), Universal precautions, including injection safety, Geneva, 2006.
- [8]. E. Orji, O. Fasubaa, and U. Onwudiegwu, Occupational health hazards among health care workers in an Obstetric and Gynaecological unit of a Nigerian Teaching hospital, *J. Obstet. Gynaecol.*, 22, 2002, 75-78
- [9]. World Health Organization (WHO), Aide memoire for a strategy to protect health workers from infection with blood borne viruses, Geneva, 2003
- [10]. D.J. Gawkrödger, M.H. Lloyd, and J.A. Hunter, Occupational skin disease in hospital cleaning and kitchen workers, *Contact Dermatitis*, 15, 1986, 132-135

- [11]. L. Stingeni, V. Lapomarda, and P. Lisi, Occupational hand dermatitis in hospital environments, *Contact Dermatitis*, 33, 1995, 172-176.
- [12]. A. Bello, M.M. Quinn, M.J. Perry, and D.K. Milton, Characterization of occupational exposures to cleaning products used for common cleaning tasks-a pilot study of hospital cleaners, *Enval Health*, 8, 2009, 11-21
- [13]. J. Zock, M. Kogevinas, J. Sunyer, E. Almar, N. Muniozguren, F. Payo, J. Sanchez, and J.M. Anto, Asthma risk, cleaning activities and use of specific cleaning products among Spanish indoor cleaners, *Scand J Work, Env Health*, 27, 2001, 76-81.
- [14]. J. Zock, M. Kogevinas, J. Sunyer, D. Jarvis, K. Toren, and J. Anto, Asthma characteristics in cleaning workers, workers in other risk jobs and office workers, *European Respiratory Journal*, 20, 2002, 679-685.
- [15]. A. Karjalainen, R. Martikainen, J. Karjalainen, T. Klaukka, and K. Kurppa, Excess incidence of asthma among Finish cleaners employed in different industries, *European respiratory journal*, 19, 2002, 90-95.
- [16]. M. Kopferschmitt-Kubler, J. Ameille, E. Popin, A. Calastreng-crinquard, D. Vervloet, M. Bayeux-Dungladd, and G. Pauli, Occupational asthma in France: A 1-year report of the Observatoire National de Asthmes Professionnels Project, *European Respiratory Journal*, 19, 2002, 84-89.
- [17]. M. Medina-Ramon, J.P. Zock, M. Kogevinas, J. Sunyer, and J.M. Anto, Asthma symptoms in women employed in domestic cleaning: a community based study, *Thorax*, 58, 2003, 950-954.
- [18]. M. Medina-Ramon, J.P. Zock, M. Kogevinas, J. Sunyer, Y. Torralba, A. Borrell, F. Burgos, and J.M. Anto, Asthma, chronic bronchitis, and exposure to irritant agents in occupational domestic cleaning: a nested case-control study, *Occupational and Environmental Medicine*, 62, 2005, 598-606.
- [19]. M. Medina-Ramon, J.P. Zock, M. Kogevinas, J. Sunyer, X. Basagana, J. Schwartz, P.S. Burge, V. Moore, and J.M. Anto, Short-term respiratory effects of cleaning exposures in female domestic cleaners, *European Respiratory Journal*, 27, 2006, 1196-1203
- [20]. G.L. Delclos, D. Gimeno, A.A. Arif, K.D. Burau, A. Carson, C. Lusk, T. Stock, E. Symanski, L.W. Whitehead, and J.P. Zock, Occupational risk factors and asthma among health care professionals, *Am J Respir Crit Care Med*, 175, 2007, 667-675.
- [21]. E. Andersson, A.C. Olin, S. Hagberg, T. Nilsson, and K. Toren, Adult onset asthma and wheeze among irritant exposed bleachery workers, *American Journal of Industrial Medicine*, 43, 2003, 532-538.
- [22]. H.M. Hasselhorn, A. Toomingas, and M. Lagerstrom, *Occupational health for health care workers: A practical guide*, (Amsterdam, Netherlands: Elsevier Science B.V., 1999, p.1-113).
- [23]. I. Ashton, and S.F. Gill, *Monitoring for health hazards at work, 3rd ed.* (Oxford, UK: Blackwell Science, 2000, p.33-185).
- [24]. J.F. Gehanno, and P. Ledosseur, Radiation problems in the health care professions, in *Occupational health for health care workers: A practical guide*, (Amsterdam, Netherlands: Elsevier Science B.V., 1999) 144-151.
- [25]. P. Jefferies, R.S. Clemett, and J.R. Turner, Radiation hazards during cobalt 60 plaque therapy for choroidal melanoma, *Aust N Z J Ophthalmol*, 21, 1993, 37-41.
- [26]. M. Christensen, Noise levels in a general intensive care unit: a descriptive study, *Nurs Crit Care*, 12, 2007, 188-97.
- [27]. E.E. Ryherd, K.P. Waye, and L. Ljungkvist, Characterizing noise and perceived work environment in a neurological intensive care unit, *J Acoust Soc Am*, 123, 2008, 747-56.
- [28]. C. Tsiou, G. Efthymiatos, and T. Katostaras, Noise in the operating rooms of Greek hospitals, *J Acoust Soc Am*, 123, 2008, 757-65.
- [29]. J.A.F. Curado, W.C.S. V. Rabelo, W. Alves, R.F. Perini, and P.H. Siqueira, A incidência de PAIR na lavanderia de um Hospital Universitário, *Arq. Int. Otorrinolaringol.*, 5(2), 2001, 113-6
- [30]. W. IJzelenberg, D. Molenaar, and A. Burdorf, Different risk factors for musculoskeletal complaints and musculoskeletal sickness absence, *Scand J Work Environ Health*, 30(1), 2004, 56-63
- [31]. S. Sukumar, and V. Karthiga, A Study on Laundry Workers Attitude towards Health Care Industry in Trichy City, *Int J Sci Res Pub*, 4(1), 2014, 1-8
- [32]. E. Muslim, B. Nurtjahyo, and R. Ardi, Analisis Ergonomi Industri Garmen Dengan Posture Evaluation Index Pada Virtual Environment, *Makara Teknologi*, 15(1), 2011, 75-8.
- [33]. Health and Safety Executive-UK (HSE-UK), Research report 491: Cost benefit studies that support tackling musculoskeletal disorders, 2006.
- [34]. G. Tseko, and C. Pilane, The nurse-midwife and use of universal precautions at a health facility in Botswana: implications for nurse training, *AIDS 2006 - XVI International AIDS Conference*, 2006.
- [35]. O.O. Enwere, and K.C. Diwe, Knowledge, perception and practice of injection safety and healthcare waste management among teaching hospital staff in South East Nigeria: an intervention study, *Pan. Afr. Med. J.*, 17, 2014, 218.
- [36]. A. Ofili, M. Asuzu, and O. Okojie, Knowledge and practice of universal precaution amongst nurses in Central Hospital, Benin City, Edo State, Nigeria, *Niger Postgrad. Med. J.*, 10, 2003, 26-31
- [37]. DHHS-NIOSH Publication No. 97-117. Symptom Survey: Ergonomics Program. Page 87
- [38]. M.S. Kumar, B.R. Goud, and B. Joseph, A study of occupational health and safety measures in the Laundry Department of a private tertiary care teaching hospital, Bengaluru, *Indian J Occup Environ Med*, 18(1), 2014, 13-20
- [39]. C. Steed, and L. Lettau, Hepatitis B Infection and Sharp-Object Injuries in Hospital Laundry Workers, *Adv. Exp. Prev.*, 1(5), 1995, 1-3
- [40]. F.P. Fontoura, C.G.O. Gonçalves, A.B.M. Lacerda, and H. Coifman, Noise Effects on Hospital Laundry Workers' Hearing. *Rev. CEFAC.*, 16(2), 2014, 395-403.
- [41]. A.C.L. Lopes, K.A. Otubo, T.C. Basso, E.J.I. Marinelli, and J.R.P. Lauris, Perda Auditiva Ocupacional: Audiometria Tonal X Audiometria de Altas Frequencias, *Arq. Int. Otorrinolaringol.*, 3(3), 2009, 293-9
- [42]. L.G. Steinmetz, B.S. Zeigelboim, A.B. Lacerda, T.C. Morata, and J.M. Marques, Características do zumbi do emtrabalhadores expostos a ruído, *Rev Bras Otorrinolaringol*, 75(1), 2009, 7-14.
- [43]. M.E. Imam, R.M. Alazab, A. Abdel-Wahed, A.A. Ghandour, and W.H. Elsaidy, Risk Assessment of Physical Health Hazards in Al-Azhar University Hospital in New Damietta, Egypt, *Egy J Hosp Med*, 53, 2013, 1019- 1035.
- [44]. I.W. Ekawati, The Influence of Work Posture To The Musculoskeletal Disorder On Laundry Workers In Tembalang Region. *International Seminar and Workshop on Public Health Action*, 2015.
- [45]. M.Manuel, L. Daphnie, S. D'cunha, and S. Suresh, A study to assess awareness on occupational health hazard among laundry workers, *Muller J Med Sci Res*, 6(1), 2015, 40-44.

EmmanuelNosa Omoijiade "A comparative study of the common health and safety complaints among laundry workers in secondary and tertiary health facilities in Nigeria."IOSR Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT) 12.5 (2018): 01-12.