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Original Research Article

Evaluation of occupational health practice in the laundry and linen service at Kenyatta National hospital, Nairobi City County, Kenya

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ABSTRACT

Background: Health facility laundry ensures provision of enough, dirt free and continuous provision of garments for medical use. Main activities involve: Arranging, thorough cleaning, disinfecting, packing and dispatch. Safety hazards are features in the workplace with a potential to cause harm. This study aimed at evaluating occupational health practise of laundry and linen services at Kenyatta National hospital in the Nairobi City County, Kenya. Specifically, the study sought to ascertain potential hazards, determine adherence levels and establish wet bulb globe temperature of workers in the Laundry and Linen Service at Kenyatta National Hospital.
Methods: This research adopted a cross-sectional analytical design through a questionnaire that was structured. One-forty (140) participants were recruited for interviewing through a systematic random sampling technique. Data was cleaned and analysis was done by use of version 22.0 of SPSS software. A Chi-test was calculated to show associations between variables.
Results: The analysis of association revealed that age ($\chi^2(2)=9.091$, $p=0.011$, $p<0.05$), level of education attained ($\chi^2(1)=10.76$, $p=0.001$, $p<0.05$) and marital status ($\chi^2(2)=9.768$, $p=0.008$, $p<0.05$) were had a signification association with knowledge on environmental aspects in laundry and linen services.
Conclusions: The hospital has made significant efforts in implementing various health and safety programs which can be adopted across different departments. The hospital management needs to ensure that workers are continuously trained on existing and emerging safety hazards, implementation of safety protocols and installation of AC system and improved ventilation within the laundry.

Keywords: Occupational health, Laundry and linen services, Hazards, Wet bulb globe temperature

INTRODUCTION

Laundry services ensure every user is persistently provided with best, unbroken and clean linen. The main tasks involved include sorting of the linen, washing, extraction, drying, pressing, folding and delivering. In Modern day evolving hospital care, admitted persons require garment provision each passing day. This makes it a requirement for ensuring conformability and patient safety, as per services of national hospitals.[1]

Procedures from the international perspective presume that secretions from sick individuals contain active microbial and viral disease agents. To prevent nosocomial infections, measures should be put in place to avoid contacts with from the secretions and other sick persons, care providers and members of the community. That is

why all the linens used in healthcare facilities should be washed and dried using appropriate methods.[2]

The reason of garment washing is to get rid or remove microbial dirt. Water cleaning, microbial redundancy, and chemical thinning are the three cornerstones of the clothing cleaning process. These steps must be taken regardless of whether linen is used or if the patient is contagious. The procedures used during washing of linen include visible removal of contaminants, thermal/ chemical disinfection and dilution to reduce viable pathogens. This should be followed by rinsing the materials at least twice enhancing removal of disinfectant and detergent effluent. Cleaning should not be done where other clean linen are stored to avoid contamination.[3] It is important to note that linen hampers need to be opened close to washing machine to avoid emptying onto the floor. Similarly, all clear polythene bags are discarded as hospital waste. When a moisture bag is present in the infectious linen, avoid opening it and instead place it directly into the washing machine. Place the usable hampers into the washing machine and follow the manufacturer's instruction based on the weight.

Wash the used and highly infectious materials using thermal decontamination. Elimination of pathogens is done by maintaining a temperature of 65°C for at least a sixth of an hour or 71°C for about three minutes. This procedure guarantees proper mixing and heat dispersion. According to Sinelnikov, they argued that when utilizing machines with low degrees of loading less than 0.056kg/l, 4 minutes should be added and while those with more than 0.056kg/l degrees require an addition of at least 8 minutes to given timelines is recommended.[4] The primary goal when developing occupational health and safety measures is to protect workers from being exposed to health hazards arising from the workplace. Employees should be protected from physical and psychological illnesses. It is the duty of management to ensure workers are protected from occupational risks in the workplace. Laundries are responsible for delivering sterilized clothing across the hospital's various units. Lack of or delay in delivery of hospital clothing has an impact on hospital activities and the quality of health treatment, particularly in terms of patient safety and comfort. Operating rooms, the inpatient units, ICU, and other critical locations rely heavily on the laundry service's effectiveness, since a shortage of or delayed delivery of hospital linen can lead to significant difficulties in patients' care. Despite its importance, several studies have shown increase in nosocomial infections through linen used in facilities.

Considering significance of laundry unit in containing nosocomial infections, little efforts have been put in place to address the safety and health of workers. Employees provide laundry services in hospitals perform arduous responsibilities and are subjected to a variety of occupational and environmental hazards, including puncture and laceration exacerbated by syringes and scalpels. Infections resulting from microbial, economic output expectations, autocratic professional relationships, and physicochemical and biological hazards such as excessive heat, humidity, dust, fumes, steam, and loud sounds. Wounds created by syringes and other incision objects expose patients to infections through microorganisms in bodily fluids including blood. Stressors make it very difficult for personnel to conform with organizational procedures, leading to changes in daily routines that can occasionally result in health risks.

Management ought to put mechanisms in place in the workplace, communities surrounding the workplaces and wider environments to minimize risks associated with nosocomial infections. They should embrace adoption of appropriate laws and change attitude to workers to enhance commitment to health and safety issues. Existence of contaminants in the workplace poses risks to workers affecting their ability to provide quality services to clients. Physical and biological factors are also potential health risks. Health risks and human organisms can interact through the skin, ingestion and inhalation.[5] Other factors mentioned in the literature include worker discontent and too long working hours while standing up with no breaks, which might exacerbate psychical difficulties and cause diseases. Treated linens should be kept clean and free of damage or discoloration. Processed linens which fail to meet the standards must be thrown of via domestic solid waste through linen service division or place of origin through notification if necessary. Laundry hamper should indeed be emptied as closely to a washing machine and it should not be emptied on the floor. Clear polythene bags should be discarded as medical waste. In case of water-soluble bag such as the infected linen, it should not be unsealed and must be directly placed into the machine. After dissolving the linens, put the reusable hamper into the machine. It is important following instructions as per the manufacturer based on the minimum and maximum loading weights.

Globally, linen handling in the healthcare industry has been undervalued despite its importance. There are standard operating procedures (SOPs) on how to handle dirty linen by healthcare facilities. This gives details how they should be collected from the user point, sorting, packing, laundry cleansing and package to be ready for use again by the patients and care providers. Before collecting and distributing, it is important to segregate all linen, bagged, label and store them separately. This might be a dirty place, such as sluices, or a distinct dirty linen facility. In the domestic services room, used/infectious linen must not be stored. Despite existence of SOPs of handling healthcare linen, they have not been keenly observed by those employees providing laundry services. This may be ascribed to a variety of variables ranging from mindset, competence, or an inadequate skills support monitoring.[5,6] There is no question that an organization's human resource is one of its most flexible resources. As a result, an efficient and appropriate utilization of human capital will translate to

the organizations overall productivity and efficiency. Though many businesses recognize this to be the main factor, many fail to acknowledge it as part of human resource management procedures to ensure safety of the working environment. Costs of accidents have a significant effect on the company as well as the employee involved.

As a result, managers and employees should strive to avoid them from occurring at work. Employees working in hospital are seriously exposed to a variety of chemicals and biological hazards. As a result, management's failure to implement sufficient health and safety practices to safeguard personnel from these dangers and risks would result in needless fatalities and, eventually, workforce loss. Limited knowledge on embracing compliance with safety and health requirements also limits its efficacy. In reality, it should be the responsibility of both the management and worker to observe health and safety.

Contrary to popular opinion, this wasn't the case in the majority of companies. There is indeed a poor coordination between workers and management in order to effectively address health and safety concerns.[7] Failure to detect potential hazards and comprehend the consequences on the hospital personnel will have severe repercussions. Moreover, it is critical to ensure that the measures are monitored and reviewed regularly in order to assess their efficiency. The lack of the measures impedes work performance, and the workers suffer as a result. Employee attitudes are important in terms of health and safety. Many personnel are never concerned regarding the safety and avoid engaging with safety programs, rendering safety precautions useless. Indeed, any safety precaution or activity taken by the government or company may be rendered ineffective if workers are really not devoted. Management sometimes do not consider occupational health and safety being a continuous cycle. Implementing measures pertaining safety in the workplace requires proper training which has not been given adequate consideration.[8]

In essence, management's intentional effort to implement safety measures and guarantee that the regulations are followed encourages employees to remain conscious about safety at all circumstances. A comprehensive understanding of OSH is needed for facility administrators to establish appropriate industrial safety policies that are proportionate to global standards, consistent with the government policies, and fulfill the company effectiveness of providing the best care and personal gratification. Most African nations have indeed been destroyed by tropical illnesses, poverty rates are alarming wars, and conflicts have been continuous. As a consequence, public facilities including hospitals have taken full advantage of the crisis. Several hospitals have all had poor management systems, and few studies are available on laundry and linens production, pickup, segmentation, use, and disposal, as well as associated environmental effect. As a consequence of recycling already contaminated clothing, occupational illnesses have become prevalent. Kenya, as a young country, has faced the same challenges just like other third-world nations in terms of laundry and linen pickup, segregation, laundering, stitching adjustments, and usage. It has resulted in frequent transmission of occupational illnesses that could have been prevented. The research aimed to bridge the existing gaps inside the majority of public and private hospitals. This was done to identify a possible hazard, environmental consequences, degrees of compliance, and also how the heat levels influence employees.

Every day, a large number of people are released and hospitalized at the Kenyatta National Hospital. It has multi-disciplinary facilities with a large volume of linens usage. As a consequently, it is important to streamline the process to guarantee that the referral hospital has a consistent supply, segregation, cleaning, and usage of linen. This was done to guarantee that the laundry department's facilities were adequately utilized and that the frequency of occupational illnesses was reduced. This was to lower hospital bills, reduce time wastage, sick offs, absenteeism due to injury, compensation and mitigating the wet bulb index levels to lower cases of heat strains and stresses witnessed inside the laundry department. To evaluate the occupational health practise in the laundry and linen services at Kenyatta National Hospital in the Nairobi City County, Kenya. The study was guided by the following objectives: to identify the potential hazards associated with laundry and linen services at Kenyatta National hospital, to describe the adherence level to the laundry and linen services standards at Kenyatta National hospital and to establish the wet bulb globe temperature of workers in the laundry and linen service at Kenyatta National hospital.

METHODS

Participants and study site

The research was undertaken at Kenyatta National hospital (KNH). This hospital is located at Upper Hill area along Ngong Road, Nairobi Kenya. Kenyatta National Hospital management has significantly emphasized development of occupational health and safety practices across departments and thus provides a better setting to evaluate the occupational health practices that have been put in place. In this study, a cross sectional analytical design was adopted to collect data from Kenyatta National hospital. This was preferred to other designs as it enabled collection of information which answered the questions and preciseness of the investigation under consideration. The study was also to integrate exploratory research design to formulate a problem for more precise investigation. The study targeted 140 laundry staff at Kenyatta National hospital. It focused on the laundry at KNH in order to determine the level of engagement across all departments and cadres. This includes managers, housekeepers, tailors,

laundry and maintenance. The selection criteria of the respondents were those who were present and those who agreed to take part in the study. Out of the 140-laundry staff 114 met the criteria. The study employed a cluster sampling technique. This enabled the researcher to obtain proportionate samples from each selected cluster. The total population was divided into job cadres of staff working in the laundry department. The research was conducted for the period between September 2014 to October 2015. A structured questionnaire was used by the researcher to collect relevant information regarding the study. The questions that were included in the questionnaire were be both open and closed to allow for variety of responses.

Data collection

A structured questionnaire was used by the researcher to collect relevant information regarding the study. The questions that were included in the questionnaire were be both open and closed to allow for variety of responses. Information assembling was started after approval from relevant authorities, followed by data analysis. Primary data collection procedure was employed. The researcher recruited trained assistants to help in this exercise. The Staff who express unwillingness to participate in the study were not be coerced to do so. Only the persons who consented and signed the informed consent proceeded with filling the question as directed by a research assistant. Consent forms were issued where respondents signed to show their approval for engagement. They participants were not required to provide any personal information since they had to participate under an eye of anonymity. The assisting personnel were trained to make sure that the participants understood the data collection process fully and on guiding the participants during the data collection. The requirements of the research assistants were a KCSE certificate and a better understanding of the Kenyatta National hospital structures in order to have an easy time in data collection. Permission for data collection was obtained from KNH administration. The respondents were informed that it was not mandatory to participate in this exercise. Confidentiality of the participants was highly monitored where participants were not required to provide any personal information. There were no known risks in participating in the study and those who were involved were given an optioning of withdrawing from the study or not answering questions which affected their morals and values in a negative manner. Data collection was done randomly to enhance privacy of the study participant

Data analysis

After the data collection process, the study was analyzed based on both qualitative and quantitative techniques. The quantitative analysis focused on test for association between the study variables. SPSS version was used for analysis of data which median, mean, mode, the variance and standard deviation. The results were presented in charts, percentages and frequency tables. Inferential statistics that were included in this case were measure of association where a chi square test was integrated to provide an understanding on the association of occupational health and safety practices and other factors in the study such as demographic factors.

RESULTS

A total of 114 questionnaires were issued. Four of the questionnaires were not returned for analysis. Only 110 questionnaires were correctly filled representing 96% response rate as shown in (Table 1).

Table 1: Response rate.

Total sample size (n)	Returned for Analysis (N)	Response rate (%)
114	110	96

Socio demographic characteristics of the study respondents

The analysis showed that, 66 (60%) of the respondents were female and 44 (40%) were male. More than half, 58 (52.7%) of the respondents were aged between 31 and 50 years, 29 (26.4%) were aged between 20 and 30 years while 23 (20.9%) were aged above 50 years. in assessing the level of education, 59 (53.6%) had secondary level of education whereas 51 (46.4%) had tertiary education. Majority, 101 (91.8%) of the respondents were employed on permanent basis. Analysis of marital status showed that 68 (61.8%) were married, 31 (28.2%) were single and 11 (10%) were either divorced or separated. The findings also showed that 102 (92.7%) were Christians as shown in (Table 2).

Table 2: Socio-demographic characteristics of study participants.

Characteristic	Category	N	%
Gender	Male	44	40
	Female	66	60
Age group (years)	20 - 30	29	26.4
	31 - 50	58	52.7
	Above 50	23	20.9
Education level	Secondary	59	53.6
	Tertiary	51	46.4
Employment status	Permanent	101	91.8
	Contract	9	8.2
Marital status	Single	31	28.2
	Married	68	61.8
	Divorced/separated	11	10
Religion	Christian	102	92.7
	Muslim	8	7.3
Years worked in the laundry department (years)	Less than 5	30	27.3
	5-10	37	33.6
	More than 10	43	39.1

Potential hazards associated with laundry and linen services at Kenyatta National hospital

A chi-test for association was conducted to determine the association between respondent socio-demographic factors and knowledge of the common hazards in laundry department. The findings showed that there was significant association between age and knowledge of the respondents ($\chi^2(2)=5.483$, $p=0.045$, $p<0.05$) as well as association between religion and knowledge of common hazards within the laundry department ($\chi^2(1)=4.172$, $p=0.041$, $p<0.05$). There was no association between other socio demographic factors, gender, ($p=0.197$), Education level ($p=0.078$), employment status ($p=0.104$) and marital status ($p=0.756$) and years worked ($p=0.148$) with knowledge of common potential hazards within the laundry and linen service department. The results are as shown in (Table 3).

Table 3: Association between socio-demographic characteristics and knowledge of common hazards outcomes in laundry and linen service department.

Socio-demographic variable	Df	Chi-square	P value
Gender	1	1.287	0.197
Age group of the respondents	2	5.483	0.045
Level of Education	1	2.879	0.078
Employment status	1	3.229	0.104
Marital status	2	0.559	0.756
Religion	1	4.172	0.041
Years worked	2	3.814	0.148

Levels of adherences to the laundry and linen services standards at Kenyatta National hospital

The analysis of association shows that there was a statistically significant association between, gender, ($\chi^2(1)=4.06$, $p=0.043$, $p<0.05$), level of formal education, ($\chi^2(1)=5.789$, $p=0.001$, $p<0.05$) and years worked in laundry department, ($\chi^2(2)=5.006$, $p=0.027$, $p<0.05$) with adherence to standard operating procedures in laundry and linen services. There was no association between age of the respondents ($p=0.067$), employment status, ($p=0.557$), marital status ($p=0.198$) and religion, ($p=0.399$) and adherence to standard operating procedures in laundry and linen services. The outcome is as shown in (Table 4).

Wet bulb globe temperature among respondents working at laundry department

The analysis as shown in (Table 5) identify that there was statistically significant association between gender, ($\chi^2(1)=19.097$, $p=0.000$, $p<0.05$), employment status, ($\chi^2(1)=3.953$, $p=0.047$, $p<0.05$) and the level of heat index awareness in laundry and linen services, ($\chi^2(1)=3.953$, $p=0.047$, $p<0.05$). There was no association between age ($p=0.754$), education level ($p=0.569$), marital status ($p=0.087$), religion ($p=0.139$), years worked ($p=0.916$) and level of heat index awareness in laundry department.

Table 4: Chi square test of proportionality for respondents' social demographics and adherence to standard operating procedures in laundry and linen at KNH.

Social demographic		N	%	Chi-Square test
Gender	Male	44	38.59	$\chi^2= 4.06$ $p= 0.043$
	Female	60	52.63	
	Total	114	100	
Age of the respondent (years)	18-29	22	19.29	$\chi^2= 3.96$ $p= 0.067$
	30-39	26	22.8	
	40-49	39	34.2	
	50-59	25	21.92	
	60 and above	0	0	
	Total	114	100	
Level of education	Primary	12	10.5	$\chi^2= 5.78$ $p= 0.001$
	Secondary	59	51.7	
	Tertiary	33	28.9	
	Total	114	100	
Marital status	Single	26	22.8	$\chi^2= 6.530$ $p= 0.0198$
	Married	73	64.03	
	Widowed	8	7.01	
	Divorced	7	6.01	
	Total	114	100	
Years worked	0-10	5	56.9	$\chi^2= 5.006$ $p= 0.0027$
	11-20	33	28.4	
	20 and above	76	14.7	
	Total	114	100	

Table 5:Association between Sociodemographic characteristics and WBGT index awareness among respondents in laundry and linen services at kenyatta national hospital.

Socio-demographic variable	Df	Chi-square	P value
Gender	1	19.097	0.000
Age group of the respondents	2	0.565	0.754
Education level	1	0.002	0.569
Employment status	1	3.953	0.047
Marital status	2	4.892	0.087
Religion	1	0.134	0.139
Years worked	2	0.176	0.916

DISCUSSION

Results from the study indicated that most (60%) respondents in laundry and linen service department in hospital are female compared to men (40%). The results further show that majorities (52%) of them are aged

between 31 and 50 years, 53% had secondary education, and 91.0% were employed permanently. Regarding marital status, 61.8% of them were married and 92.7% of the respondents were Christians. These findings are comparable to Michael et al which found that 65% of the employees in laundry department were women. Additionally, the study revealed that most of the respondents were over 35 years of age. Heudorf et al also found that majority of women preferred working in laundry department and majority of them had high school level qualification. Working in laundry department requires less focus on academic requirement based on the basic nature of the responsibilities within the department. The lower level of qualification requirement means that most people are able to successfully work in the department across all age groups.

Laundry department within a hospital setting is vital and present a stronger focus on the need to maintain an improved commitment on the common occupational safety practices that are needed. The study found that 86% of the respondents stressed that they have knowledge on the common potential hazards that are associated with laundry and linen service industry which included occupational accidents and injuries, hearing loss as a result of excessive noise from laundry machines and spread of communicable diseases. These findings are comparable to Belvoir who found that the surfaces in hospital and the gowns and linen worn by patients suffering different diseases are mixed and taken to the laundry department for cleaning which increases the risk for communicable diseases among the laundry employees. Omoijiade also found that common hazards in laundry department are classified in five groups which include physical, mechanical, chemical, bacterial and psychosocial hazards.[9,10] The common physical hazards noise, vibration, radiation and heat. Mechanical hazards such as injuries. Chemical hazards include solid, liquid and vapors, bacterial hazards are viral, bacterial and fungal. Exposure to any of these hazards can cause occupational diseases and work accidents. The knowledge of employees in laundry department on common hazards differs based on different factors. The research findings showed that age and religion were significantly associated with knowledge on potential hazards in laundry department. In a study conducted by Johnson found an association between knowledge on hazards and employee experience, education level and religion. Employees with higher experience were more likely to have an understanding on common potential hazards within the laundry department. Study results depicted that there were potential hazards such as disease-causing pathogens emanating from contaminated laundry garments and equipment used in laundry.[11] This in turn makes workers to be potential patients leading to call for sick offs hence delayed optimal performance of laundry department. Non disposed waste could result in blockage of drainage systems; High noise levels could have a long-term effect on loss of hearing while particulate dust could be agents of respiratory illnesses. In a study conducted by Johnson found an association between knowledge on hazards and employee experience, education level and religion. Employees with higher experience were more likely to have an understanding on common potential hazards within the laundry department.

Adherence to OSH protocols were low despite workers being aware, while some never new of their existence while others ignored, these has led to exposure to hazards and injuries to laundry staff, this pointed to a laxity in either new staff not being properly oriented or poor appraisal or updating of safety protocols. Kumar found similar results where adherence to OSH protocols where not fully followed putting the laundry workers at safety and health at risk.[12] Adherence to standard operating procedures in laundry department is important in controlling the influence of common occupational hazards to employees within the department as well as the immediate environment. Wet bulb globe temperature was above average in some sections of the laundry leading to increasing working temperatures in this area which in turn affected the output of the workers. This increased sweating levels and fatigue amongst the laundry staff. One of the key physical hazards in the laundry is stress due to heat. This is because it can lead to syncope, discomfort, heart stroke and in severe cases, death may result. On awareness of heat index level, it was reported that 73% of those interviewed were aware with just only 55% had knowledge on the effect of high heat index. Sweating and heat rashes were the common effect of high heat index as identified by the respondents. Venugopal et al found comparable results that 82% of employees in laundry department were exposed to larger hotter periods.[13-15] Employees who reported more health related issues were those with heavy and more workloads. The common effects of high heat stress index were dehydration, heat rashes, and symptoms of urinogenital. Provision of better personal protective equipment is essential in controlling the negative outcomes of high heat stress index level.

CONCLUSION

The study provided a strong understanding on important aspects regarding occupational safety and health practice at the laundry and linen department at the Kenyatta National Hospital. The hospital management has made significant effort in implementing various health and safety programs which have been adopted across different departments. However there have even significant challenges regarding implementation and ensuring that there is high level sustainability in terms resources and OSH knowledge amongst employees in the laundry and linen department. Potential hazards in the laundry and linen service department; Hazards identified were Microbes, Non- disposed waste, Noise, particulate dust and carbon dioxide gas. Each of these hazards poses a different threat to the health and safety of laundry and linen workers. These results are similar to Johnson where varying microbial agents were isolated. The levels of

OSH adherence to laundry and linen service. Standard operating procedures were not well articulated and followed. This concurs with a similar study, Kogi that states that consistent healthcare audits have been instrumental in maintaining strong focus on development and implementation of better health and safety practices across different departments. Thus, the level of compliance to the health and safety practices among employees has been increasing steadily based on increased awareness although there is need to ensure that the implemented programs are sustained to create a strong environment where employees can perform their tasks effectively to attain the healthcare goals defined within the hospital charter. The Wet bulb globe temperature at linen and laundry service department; the wet bulb globe temperature was high in some sections. This resulted to sweating and easy fatigability amongst the workers. This resulted to low output therefore mitigation measures are required. Venugopal found comparable results that 82% of employees in laundry department were exposed to larger hotter periods. Workers with heavy workloads reported more heat-related health issues and reduced productivity. If put in place, this department will maximize its potential thus lowering cost of doing business.

Recommendations

The adoption of different programs within the hospital has been integral in maintaining strong focus on important changes which help in defining improved outcomes. Health and safety audit programs, health and safety policy programs, wellness programs, health and safety committees and occupational health surveillance. High level of commitment and implementation of these programs within healthcare environment will be critical in maintaining high quality healthcare and increased level of employee satisfaction which are key management objectives. The evaluations of these processes are important and provide a unique understanding on the changes that are being implemented.

To minimize effect of Potential hazards associated with laundry and linen services at Kenyatta National hospital. Ensure proper sorting, segregation, transportation and washing of hospital linen need to be enhanced. This has to be implemented by laundry staff. Proper disposal of non-reusable materials is paramount, and public health officers in the hospital are recommended to effect. Designing of devices through engineering has been discussed as a human centered intervention for performance improvement. In the hospital set-up, this calls for mechanisms of exposure avoidance by individuals and pathogen colonization through space designing as an administrative control measure. This would identify primary sources and contributors to OSH issues. This is past training and education which are focused on to prevent infections, modification of individual perspective such that desired actions are attained in case of default decisions. This uses environmental designs including washing of hands or setting up disinfectant stations at points of exit. This calls for better leadership for oversight and implementation of OSH procedures and policies. To increase effectiveness in cleaning rooms and disinfection which reduces bacterial bio-burden in the rooms of the patients, there is need to apply the models of human factor engineering systems together with auditing and feedback Sometimes strategies put forth to mitigate pollution through carbon dioxide fails to solve the situation. This calls for preventive approaches through promotion of measures that are effective before pollution reaches levels of criticality. To capture this, it is recommended that KNH management should supports monitoring of air pollution using new technologies. To ensure safety and health of laundry workers, it is recommended that distribution of spatiotemporal air pollution is monitored using established networks. According to Masso, sensor networks provide the potential to monitoring pollution of air that reflects high temporal and spatial predictability of levels of pollutants. This would provide room for adoption of measures to reduce pollution related to carbon dioxide when the target limit is exceeded by the pollutants and all sources established. However, to make informed decisions, it is advisable to apply models of air quality prediction. This is the best approach in ensuring compliance with regulations as pertained to the quality of air. To reduce workplace exposure to noise, it is recommended to apply engineering and administrative controls. In engineering control, modifications or replacement of equipment or adopting physical changes at the source and minimizing noise exposure at the workplace has been shown to be effective. Examples in this may include; choice of machinery and tools with low-noise levels, lubricate and maintain equipment and machinery, placing a barrier between the source of noise and the worker and isolating or enclosing the source of noise. In administrative control, there is need to adopt changes that make the work environment less risky such as schedules that may minimize or eliminate noise exposure to workers. This may include; noisy machines to be operated in shifts, limited exposure time at the source of noise and provision of areas of quietness for relief of workers exposed to sources with hazardous noise. The simplest and cheapest administrative control mechanism for exposure to noise is through distance. Noise is reduced by 6 dB whenever distance between the worker and the source is doubled. In order to effect adherences to the laundry and linen services standards at Kenyatta National Hospital, the management should: iIncrease the Hospital, the frequency of health audits across all departments to help improve on compliance and adoption of OSH practices, ensure that there are operational health and safety committees and Ensure that employees are highly engaged in development and implementation of health and safety programs. To mitigate effect of wet bulb globe temperature of workers in the laundry and linen department. This study recommends the management to install AC equipment and proper ventilation. This will go a long way in improving air circulation within the laundry

building. This study proposes other researchers to study occupational safety and health practice at this hospital facility in order to complement the findings. This will go a long way in improving the overall performance of the entire institution to the benefit of the public. Further studies should be conducted to establish reporting rates after implementing the above recommendations. More studies should be conducted across all hospitals laundry in the Country to make the reporting process hassle-free and harmonize laundry and linen practice.

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