

Effects of Occupational Safety and Health Management Practices on Work Environment in the Water Service Industry within Kisumu County - Kenya

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Abstract: *The study sought to evaluate the impacts of occupational safety and health management practices on work environment in the Kenyan Kisumu County Water Service industry. The study utilized a descriptive research design. The target population consisted of employees of Kisumu Water and Sewerage Company (KIWASCO) and Lake Victoria South Water Service Board (LVSWSB) working in water treatment works, waste water treatment plants and construction sites. From population of 410, Sample size was determined using standard formula by Fisher (1983). Since the population was <10,000, the formula by Mugenda & Mugenda, (2003) was applied and 81 number of Questionnaires used to obtain primary data finally analyzed using quantitative techniques. A simple random sampling was employed to draw the respondents from each site and self-administered semi-structured questionnaire was used to acquire data. The data was analyzed using Statistical Package for Social Sciences version 21. Frequencies and percentages were obtained and correlations done using Spearman's correlation coefficients. On the respondents organizations, majority at 57(75%) worked at KIWASCO, 12(15.79%) worked at LVSWSB while the minority at 7(9.21%) worked at GULF. Preponderance of the respondents at 61(80.3%) were males while the least at 15(19.7%) females. Most of the respondents at 28(36.6%) were between 29-39 years of age while the same number of respondents forming the minority at 24(31.6%) were both between 18-28 years and 40-50 years of ages. Preponderance of the respondents at 61(80.3%) had attained college level of education as their highest, 9(11.8%) attained secondary while the minority at 6(7.9%) had attained primary level of education as their highest. On the number of years worked for the organization, majority at 27(35.5%) had worked for 4 years, 24(31.6%) had worked 1 year, 15(19.7%) had worked for 3 years while the least number of respondents at 10 (13.2%) had worked for 2 years for their organization. Preponderance of the respondents at 49(64.5%) stated that water supply was their nature of work, 14(18.4%) stated construction as their nature of work while the minority at 13(17.1%) stated waste water as their nature of work. The study conducted a logistic regression analysis to ascertain the relationship between the dependent and the independent variables pulled together but holding the rest constant each time. The study analyzed the relationship between occupational safety and health management practices and work environment using Spearman's rho coefficient, CL=95%. It was established that there is a significant strong positive relationship between occupational safety and health management practices and the work environment, $r(76) = 0.690^{**}$ $p=0.000$. This meant that if the OSH management practices were strengthened, the work environment would improve. Standard deviation was adapted to measure disparity for the likert-scale questionnaires. It was established that practicing occupational safety and health to a large extent would increase the chances of conducive working environment in the water service industry in Kisumu County by 80.056%.*

Keywords: Occupational health, safety, exposure, Hazards, water service industry, work environment

1. Introduction

1.1 Background

According to European Agency for Safety and Health at work (2007), the health of adults of working age affects economic and social development. Recent occupational health data indicate that 40%-50%, of the world population is exposed to hazardous conditions in the workplace. It is estimated that approximately 250 million occupational accidents occur worldwide each year, with 335,000 fatalities ILO, (2005) as cited in Thobora & Thuita, (2015). Hazards at work are in different forms –chemical, physical, biological, psychological and ergonomics. More than 4% of the world's annual GDP is lost to occupational accidents and disease (ILO, 2001) as cited in Thobora & Thuita, (2015). Less attention has been given to occupational accidents by injury researchers in Africa.

The healthy workplace concept provides a valuable tool for developing or reinforcing occupational health and safety standards so that conditions continuously improve for the working population. However, a healthy workplace is not only free of hazards, but also provides an environment that is stimulating and satisfying for those who work there. The healthy organization acknowledges all the elements of occupational health and safety in developing policies and programs for the wellbeing of its workers (WHO, 1999).

Abraham Maslow in the hierarchy of needs theory on human motivation used the terms Physiological, Safety, Belongingness and love, Esteem, Self-Actualization and Self –Transcendence needs, to describe the patterns that human motivations generally move through. This study employs the theory of hierarchy of needs on Safety. Safety at work ranks as an important factor in job satisfaction (Kreitner, 2007; Thobora & Thuita, 2015).

It is argued that there has been low compliance to health and safety regulations; where the level of regulation and enforcement of occupational health and safety is grossly inadequate especially when compared to developed countries (Rotich & Kwasira, 2015). During worker's time they are exposed to various hazards including accidents, noise, dust, vibrations, heat and harsh chemicals among others (Nzuve & Ayub, 2012).

1.1.1 The occupational Health and Safety Act 2007

The occupational Safety and Health Act 2007 aims at securing the safety, health and welfare of workers and the protection of persons other than the workers against the risk to safety and health arising out of, or in connection with the activities of persons at work. The Act sets objectives to promote and improve occupational safety and health standards.

The OSH services in Kenya are governed by two pieces of legislation: the Occupational Safety and Health Act (OSHA), 2007 and the Work Injury Benefits Act (WIBA), 2007. The purpose of OSHA, 2007 is to secure the safety, health and welfare of people at work, and to protect those not at work from risks to their safety and health arising from, or in connection with, the activities of people at work. The purpose of WIBA, 2007 is to provide compensation to employees for work-related injuries and diseases contracted in the course of their employment, and for connected purposes.

1.1.2 Management of Occupational Health and Safety

Katsuro *et al.*, (2010) study found that bad occupational health and safety practices in food factories decrease the workers performance, leading to decline in productivity. Njuguna, (2007) confirms that providing a safe environment and minimizing potential risk are both the moral and legal responsibility of the organizations and that a safety culture should be maintained when they are attentive to safety issues. He advises that a positive safety culture can be developed through the allocation of praise, promotions and cash to employees who behave safely. This implies that when workers are well motivated they behave safely at workplace, this minimizes the human error that may cause or create unsafe working environment.

1.1.3 Health and Safety Policies and Procedures

Specific policies and procedures address particular issues or hazards. They are administrative measures to control workplace hazards and should be used together with other hazard control measures to eliminate or reduce the risks of workplace illness or injury. Health and safety policies are part of a framework for effective health and safety management. A general health and safety policy states management intention to provide a safe and healthy workplace, and states the health and safety goals of a workplace. It should also demonstrate the duties and their intention to voluntarily comply with those duties. An objective of the occupational health and safety Act 2007 is the elimination at the source of risks to the health, safety and welfare of persons at work. The supportive regulations to this Act include the measures to control risk by eliminate toxic substances, hazardous plant or processes which are not necessary to a system of work. Risks can be eliminated so

far as practicable by use of one or more of the following methods:

- Substitution
- Isolation
- Engineering controls
- Administrative controls
- Personal Protective Clothing and equipments.

1.1.4 Work Environment

According to European Agency for Safety and Health at work, (2007); OSH culture can be described in terms of the informal, cultural aspects of an organization. The latter can have an impact on how OSH is perceived and dealt with, and on whether people are aware of OSH-related issues and act in a safe and healthy way.

The term 'safety culture' appears to have been first used after the Chernobyl disaster in 1986. (Taken from Wikipedia, http://en.wikipedia.org/wiki/Chernobyl_disaster).

Satisfying work in a safe and pleasant environment is a source of health and well-being; yet the physical, psychological and organizational work environment is all too often responsible for injury and disease. The health of adults of working age affects economic and social development. Recent occupational health data indicate that 40%-50%, of the world population is exposed to hazardous conditions in the workplace. It is estimated that approximately 120 million occupational accidents occur worldwide each year, with 200,000 fatalities. Each year between 68 million and 157 million new cases of occupational diseases arise as a consequence of various types of work-related exposures.

In addition, approximately 30% -50% of workers in industrialized countries experience psychological stress. Environmental stressors such as hazardous conditions are one cause, but occupational stress results from work organization (e.g. workload, lack of autonomy and control over work, shift work, wage scales and routine, repetitive work). Stress associated with work organization has been shown to contribute to cardiovascular disease, muscular skeletal problems and other conditions. Other than the transfer of unsafe technologies, the changing nature of work will have a dramatic impact on worker's health. Technological innovations will result in job losses, replacement of full time work and part-time work, more work in the informal sector and self-employment.

Unfortunately, only 5%-10% of workers in developing countries and 20%-50% of workers in industrialized countries have access to adequate occupational health services. In many countries there are neither the resources nor the control of occupational hazards. Healthy workers are more likely to be productive workers, who are essential for successful business and lay the foundation for a prosperous economy and sustainable development.

The healthy workplace concept provides a valuable tool for developing or reinforcing occupational health and health standards so that conditions continuously improve for the working population. However, a healthy workplace is not only free of hazards, but also provides an environment that

is stimulating and satisfying for those who work there. The healthy organization acknowledges all the elements of occupational health and safety in developing policies and programs for the wellbeing of its workers (WHO, 1999).

2. Methodology

The study utilized a descriptive survey research design. The target populations for this study were 81 number staff working in the clean water treatment, waste water treatment and new project construction sites of LVSWSB and KIWASCO Limited. Descriptive research technique was used as an action strategy to study the current situation in defining the OSH in the water industry. The target population constituted of 60 workers in LVSWSB, 300 in KIWASCO and 50 in Gulf totaling 410 staff. The study used questionnaire, interviews and observation to obtain primary data.

Sample size was determined using a sample size standard formula by Fisher (1983). Since the population was less than 10,000, the formula by Mugenda & Mugenda, (2003) was applied at a confidence level of 95% or 1.96; p is the proportion in the population estimated to have the desired characteristics (estimated at 0.50). q is 1.0- p and d is the degree of accuracy desired (set at 0.05).

Authority was secured from both management of LVSWSB and KIWASCO to collect data. Individual participants were sensitized before seeking their consents to freely participate in the research. Questionnaires, observations and photographs were used to collect data. The collected data was analyzed using quantitative techniques. Standard deviation to measure response disparity for the Likert –scale question items was also adapted. The entire hypothesis was tested at 95% confidence level. Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to describe the characteristics of collected data.

3. Data Analysis And Findings

3.1 Demographic Information

Table 3.1: Demographic Information

Characteristics	Categories	Percentage/ Proportion
Respondents organization	LVSWSB	12(15.79%)
	KIWASCO	57(75.00%)
	GULF	7(9.21%)
Gender of the respondent	Male	61(80.3%)
	Female	15(19.7%)
Age of the respondent	18-28	24(31.6%)
	29-39	28(36.8%)
	40-50	24(31.6%)
Respondents Highest level of education	Primary	6(7.9%)
	Secondary	9(11.8%)
	College	61(80.3%)
Duration worked with organization	One year	24(31.6%)
	Two years	10(13.2%)
	Three years	15(19.7%)
	Four years	27(35.5%)
Nature of respondents work	Construction	14(18.4%)
	Water supply	49(64.5%)
	Waste water	13(17.1%)

Table 3.2: Occupational safety and health management practices and work environment in water service industry in Kisumu County

The respondents were given statements to react to in 5 point Likert Scale where 1-Strongly Disagree (SD), 2-Disagree(D), 3-Neutral(N), 4-Agree(A) and 5-Strongly Agree(SA)

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)
The employer enforces health and safety regulations	10.5%	3.9%	7.9%	50.0%	27.6%
The employer corrects unsafe acts and unsafe conditions	7.9%	7.9%	13.2%	50%	21.1%
There is always orientation program for new staff on health and safety	15.8%	11.8%	18.4%	35.5%	18.4%
The employer ensures that only authorized, adequately trained workers operate equipment	6.6%	11.8%	11.8%	38.2%	31.6%
The employers ensures the equipment are properly maintained	2.6%	11.8%	14.5%	51.3%	19.7%
The employer promotes safety awareness and information among staff	3.9%	9.2%	10.5%	51.3%	25%
The employer provides medical and remedial first aid facilities	9.2%	6.6%	21.1%	35.5%	27.6%
The employer ensures that there that personal protective equipment were available to all staff all the time	9.2%	5.3%	18.4%	44.7%	22.4%
There is an emergency response plan on health and safety	13.2%	10.5%	31.6%	32.9%	11.8%
Assessments are usually done to identify risks and hazards in the workplace	7.9%	11.8%	30.3%	36.8%	13.2%
Performance on Health and safety is regularly evaluated in our workplace	9.2%	11.8%	30.3%	34.2%	14.5%
There is a health and safety committee constituted by staff which meets regularly to review health and safety at the workplace	6.6%	21.1%	19.7%	30.3%	22.4%

4. Results and Discussion

4.1 Relationship between occupational safety and health practices and workplace environment in the water service industry in Kisumu County

Majority of the respondents at 59(77.6%) stated that the employer enforced health and safety regulations, More than two thirds of respondents at 54(71.1%) noted that the employer corrected unsafe acts and unsafe conditions. More than half of the respondents at 41(53.9%) said that there was always orientation program for new staff on health and safety. Most of the respondents at 53(69.8%) stated that the employer ensured that only authorized adequately trained workers operated equipment, It was popular among 54(71%) of the respondents that the employers ensured that the equipment were properly maintained, More than three quarters of the respondents at 58(76.3%) stated that the employer promoted safety awareness and information among staff. More than half of the respondents at 48(63.1%) noted that the employer provided medical and remedial first aid facilities. Most of the respondents at 51(67.1%) stated that the employer ensured that personal protective equipment were available to all staff all the time. Half of the respondents at 38(50%) noted that the assessments were usually done to identify risks and hazards in the workplace. Nearly half of the respondents at 37(48.7%) stated that performance on health and safety in their workplace was regularly evaluated

This representation was in line with a similar study conducted by Thobora *et al.*, 2015 that revealed that employers are expected to carry out training needs analysis and then provide to employees in appropriate languages: the information, instruction, training and supervision necessary for them to work safely. In identifying training and literacy of the employees, the plant and substances used, hazards identified and risk assessment conducted. More than half of the respondents at 40(52.7%) noted that health and safety committee constituted by staff met regularly to review health and safety at the workplace. This is in agreement with WASREB, 2015 report that both very large and large utilities have maintained acceptable levels of staff productivity due to water sector reforms under the Water Act 2002. This have seen heavy investments that have since revived formerly dilapidated infrastructure.

4.2 Regression analysis on OSH management practice and Work environment

The study analyzed the relationship between occupational safety and health management practices and work environment. It was established that there is a significant relationship between occupational safety and health management practices and the work environment. This meant that if the OSH management practices were strengthened then the work environment would improve. Njuguna, (2007) explained that when workers are well motivated they behave safely at workplace, this minimizes the human error that may cause or create unsafe working environment.

Table 4.1: Regression analysis OSH management practice and Work environment

Analysis technique	Variables	Descriptors	OSH Management Practices	Work Environment
Spearman's rho	OSH Management Practices	Correlation Coefficient	1.000	.690**
		Sig. (2-tailed)	.	.000
		N	76	76
	Work Environment	Correlation Coefficient	.690**	1.000
		Sig. (2-tailed)	.000	.
		N	76	76

The objective of the study was to find out the influence of occupational safety and health management practices on work environment in water service industry in Kisumu County. It was typical that the employer enforced health and safety regulations to a large extent, mean=3.80, SD=1.200. It was also commonplace that the employer corrected unsafe acts and unsafe conditions to a large extent, mean=3.68, SD=1.134. Regular orientation program for new staff on health and safety was to a moderate extent, average mean=3.29, SD=1.335. The employer ensured to a large extent that only authorized, adequately trained workers operated equipment, mean=3.76, SD=1.210. This also applied to proper maintenance of equipment by employers 3.74, SD=0.998.

The performance on Health and safety was regularly evaluated in the workplace to a moderate extent, mean=3.33, SD=1.148. Health and safety committee constituted by staff met regularly to review health and safety at the workplace to a moderate extent, mean=3.41, SD=1.235. The average mean was 3.56 denoting that the water service industry in Kisumu County had adopted occupational safety and health management practices to a large extent. It was established that there is a significant strong positive relationship between occupational safety and health management practices and the work environment, $r(76) = 0.690^{**}$ $p=0.000$. Logistic regression showed that practicing occupational safety and health to a large extent would increase the chances of conducive working environment in the water service industry in Kisumu County. Hence practicing occupational safety and health would increase the chances of conducive working environment in the water service industry in Kisumu County.

5. Conclusions

This research found that the water service industry in Kisumu County had adopted occupational safety and health management practices. It is deduced that there is a significant strong relationship between occupational safety and health management practices and the work environment. If the OSH management practices were strengthened then the work environment would improve.

6. Recommendations

The management of the water service industry should ensure that all the aspects of Safety and Health Act of 2007 is

implemented, especially training on occupational health and safety at the workplace.

The management of the water service industry should further improve on their occupational safety and health management practices. This will reduce the hazards and risks that their staff are exposed to, and improve the work environment for optimal productivity.

7. Recommendations For Further Research

Though the study found some significant strong relationship between occupational safety and health management practices and the work environment, it is still difficult to know extent of the relationship. Further study is therefore recommended to establish the magnitude and direction of the relationship.

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