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The Roles of Occupational Health and Safety Management System in Reducing Workplace Hazards in Tanzania Manufacturing Industries

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Abstract

Work related injuries, damages of properties, diseases and death are increasing. They are caused by working tools, environment or human actions which are used in the production activities. In this regard, there is a need to come out with measures to address the problem, through which workplace hazards can be reduced. The current study therefore assessed the roles of occupational health and safety management system in reducing workplace hazards. Specifically, the study identified the roles of occupational health and safety management guidelines, programmes and administrations in reducing workplace hazards. A questionnaire distributed to 285 respondents was used to collect primary data from big five manufacturing companies in Dar es Salaam. While the respondents were selected both conveniently and purposefully, the manufacturing companies were selected purposefully. The data were analyzed by using Partial Least Square – Structural Equation Modeling (PLS – SEM). Tables were used to describe demographic characteristics of the respondents. The findings of this study indicate that effective use and implementation of OHS guidelines, programmes and administration are crucial in reducing workplace accidents, injuries, damages and work-related diseases. The study recommend that companies have to administer, use and implement appropriate occupational health and safety policies, guidelines and programmes so as to reduce accidents, injuries, damages of properties and work-related diseases.

Keywords: Occupational health; safety management system; workplace hazards; manufacturing industry

Introduction

Work related deaths, injuries and diseases in manufacturing industries are increasing from time to time (Mrema, Ngowi, & Mamuya, 2015). Workplace hazards are the most dangerous and catastrophic events that jeopardize the life of employees and the life of companies at large (Manyele, Ngonyani, & Eliakimu, 2008). These workplace hazards are caused by working tools, working environment or human actions. The working tools, working environment and human actions are important to facilitate the production activities because these activities must involve movement of people, the use of or movement of different machines or equipment such as

hammers, cars, chairs or computers, some of which may create temperature, pressure or noise in the working environment (Yusuf, Anis, & Sari, 2012). These movements and use of machines are adversary to employees and welfare of the company because employees get injured and machines and equipment are damaged; hence the quantity or quality of products are decreased (Mohammadfam et al., 2017). It cause economic and social loss to employees and in the company (Farouk, 2017). In this regard, different countries including Tanzania set and establish standards that aim to reduce workplace accidents, injuries and work related diseases (Yoon et al., 2013). Also, many companies have established standards, actions and mechanisms that are used to manage, control and reduce workplace hazards (Mrema et al., 2015). These standards, actions and mechanisms which are used to reduce workplace hazards are known as occupational health and safety management systems. They are also referred to as occupational health and safety guidelines (OHSGs), Occupational health and safety programs (OHSPs) and Occupational health and safety administrations (OHSAs). They include guidelines (policies, laws, regulations and standards); programmes (training, rehabilitation, testing and awareness); and administration (inspections, controlling tools, involvement and committees) (Mrema et al., 2015; Sklad, 2019). The presence of hazards identification, hazards control plans and measures as well as evaluation of hazards at workplaces can reduce workplace hazards (ILO, 2011a; Yoon et al., 2013). To reduce workplace hazards, the occupation health and safety management system must ensure compliance of guidelines, implementation of established programmes and effective administration (Amponsah-Tawiah & Mensah, 2016; Rahman, et al., 2018).

The leading sectors for workplace hazards are manufacturing, mining, construction and transportation sectors, whereas some sectors such as education and tourism experience very few cases of hazards (Yoon et al., 2013). Workers are affected either physically, mentally or biologically because workplace hazards are either physical , psychological , ergonomic, chemical or biological ones (Alli, 2008; Amponsah-Tawiah & Mensah, 2016). In addition, the effects caused by workplace hazards are increasing every day. The effects involve death, disabilities and management costs to workers, the community, organizations and governments at large (Amponsah-Tawiah & Mensah, 2016). Moreover, fatal or non-fatal injuries and work related diseases are increasing. It is approximated that in average each employee lose three work days due to accidents or injuries resulting from workplace hazards particularly in Sub-Saharan Africa (Manyele et al., 2008). Manufacturing companies in Tanzania are regarded as the dangerous sector. This is because the nature of work in all manufacturing company is associated with temperature, pressure, vibration, movement, noise, chemical and turmoil. Each of these affects employees and organizations in one way or another. For example, there are physical, ergonomic, psychological, chemical and biological effects that occur to employees and damages infrastructure of the organization (URT, 2003).

Workplace hazards assessment and risk identification are important for any organization so as to take proper measures that ensure security and protection to employees, property and the whole organization against workplace hazards. It is reported that more than two millions of workers die and 300 millions get accidents or fatal and non-fatal injuries each year (Moyo & Muzimkhulu, 2015; Mrema et al., 2015).

Despite the presence of occupational health and safety guidelines, programmes and administration, workplace hazards remain one of the continuous problems in developing

countries, Tanzania inclusive. The extant studies informing about these persistent hazards are very few. For example, Gujrath, Kale and Samir (2013), Manyele et al. (2008), and Mrema et al. (2015) focused on the impacts, status and challenges facing occupational health and safety management system in Tanzania and pointed out that companies are faced with death or injuries of their employees, damages of properties and work related diseases to employees. Also, studies by Yoon et al. (2013) in Korea and by Robson et al. (2007) in Canada were conducted outside Tanzania. This makes little to be known regarding the roles of occupational health and safety management system in reducing workplace hazards in Tanzania manufacturing industries.

In all, the studies have exposed limited information concerning the roles of occupational health and safety management guidelines, programmes and administration in improving health and safety or reducing workplace accidents, injuries and work-related diseases in manufacturing industries. This knowledge gap shapes the way of conducting the current study so as to address the research problem. Given the limited knowledge concerning the roles of occupational health and safety management system in reducing workplace hazards in manufacturing industries, the current study specifically focused on:

- identifying the roles of occupational health and safety management guidelines in reducing workplace hazards;
- investigating the roles of occupational health and safety management programmes in reducing workplace hazards; and
- identifying the roles of occupational health and safety management administrations in reducing workplace hazards.

Literature Review

Conceptualization

Concepts of workplace hazards and occupational health and safety management system have been defined differently by scholars from different disciplines. In this regard, Alli (2008) defines workplace hazard as a physical condition or a psychological one or a combination of both with a possibility to cause human injuries, damage to property, destruction to environment or a combination of the three. Workplace hazards are a danger exposed to an employee which can cause harm to human beings or property if not managed in appropriate time (URT, 2010). According to URT (2003)**,** hazards at workplace mean the source of or exposure to a danger that occurs at work or when someone is working. Hazards can cause accidents, injuries and work-related diseases. Workplace hazards in manufacturing industries can be physical hazards, ergonomic hazards, psychological hazards, chemical hazards or biological hazards (Gyekye, 2006; URT, 2003). Generally, workplace hazards are incidences and sources of danger to which employees are exposed. These incidences cause accidents which result to injuries and work related diseases. Workers are affected either physically, mentally or biologically because workplace hazards are either physical hazards, psychological hazards, ergonomic hazards, chemical hazards or biological hazards (Alli, 2008; Amponsah-Tawiah & Mensah, 2016). Also, workplace hazards cause disability or mental confusion to workers due to the fatality or non-fatality nature of the injuries and work related diseases (Mrema et al., 2015). Workplace hazards are caused by temperature, pressure, movement, vibration, noise and chemical materials. Also, the hazards involve harming the human body. For instance, human body can be harmed through body cut, high or low temperature, radiations or fire exposure and short-term exposure sore

muscle which may result in long-term illness (ILO-OSH, 2013). Furthermore, workplace hazards may be caused by the nature of work like lifting heavy materials and the nature of work stations and work content, as well as working period that may results to boredom and fatigue (Alli, 2008; URT, 2010).

Management of occupational health and safety at workplace should apply all means to ensure that accidents, injuries and work related diseases are minimized. This is because they cost employees, organizations, communities and the nations at large (Amponsah-tawiah & Mensah, 2016). According to Robson et al. (2007), occupational health and safety management system (OHSMS) is a combination of related and connected elements that establish and control occupational health and safety policy, objectives and other related elements. Also, the OHSMS is the negotiated organizational management system that involve integrated specific elements that improve health and safety at workplace (Gujrath, Kale & Samir, 2013). According to Adianto, Sartika and Widodo (2017), OHSMS involves the structure of the organization, planning, responsibilities, implementation and procedures (Jingjing et al., 2020). Also, it is a process and all resources to develop, implement, maintain and review occupational health and safety policies, procedures and guidelines with the aim of ensuring safe, efficient and productive workplace organization (Christensen et al., 2017; Kiriliuk & Niciejewska, 2020). OHSMS means all guidelines, programmes and administrations concerning occupational health and safety at workplace.

Theoretical Perspectives

The theoretical perspective of this study is based on Henrich's Domino Theory and Maslow theory as constructed and demonstrated by Maslow (1943) respectively. Henrich's Domino Theory considers accidents to be the results of sequential chain of events which is arranged like line of dominoes falling over (Pejman, Aadal, & Kiyanoosh, 2013). This sequential chain of events includes social environment and origin, personal fault, unsafe act or conditions, accidents and injury (Ghasemi et al., 2013). If one domino falls (social environment and origin), it causes the fall of the next dominoes until the last but when key factors (unsafe condition or unsafe act) are removed at any point it prevents the start of the chain reaction.

Domino Theory explains that accidents and injuries are caused by unsafe conditions or unsafe acts (e.g. working environment at workplace). These unsafe conditions or unsafe acts will be catalyzed if occupational health and safety guidelines, programmes and administration act passive in the next event series like person fault and unsafe act or conditions. Eventually, workplace hazards, that is accidents, injuries and work related diseases will occur (Ghasemi et al., 2013). However, occupational health and safety guidelines (regulations and policies) programmes (training and inspection) and administration (involvement of employees and the use of proper personal protective equipment) in working environment reduce workplace accidents, injuries and work related diseases (Hosseinian & Torghabeh, 2012). In managing dominoes from falling over that cause workplace accidents, injuries and work related diseases, the organizations and government have to establish occupational health and safety laws, rules and regulations and conduct occupational health and safety training on inspection and awareness. Furthermore, the government and organizations have to involve employees in managing occupational health and

safety issues, ensure the availability of protective equipment that can be used during working periods (Hosseinian & Torghabeh, 2012).

On the other hand, Maslow hierarchy of needs theory explains that people are motivated to achieve certain needs and those needs take precedence over others. The theory developed five precedencies which are physiological needs (biological requirements for human survival like food, air, drinks, shelter and clothing), safety needs (protection which includes the elements like security, order, laws stability, freedom from fear), love and belongingness needs (this is social and interpersonal relationship that motivates behaviour), esteem needs (this includes esteem for oneself and desire for reputation or respect) and self-actualization needs (realizing potential, self-fulfillment and seeking personal goals) in the top. Safety needs is the second precedence in the theory which explains about human protection against accidents, injuries and work related diseases (Aruma & Hanachor, 2017).

Maslow hierarchy of need theory justifies that, in any organization, occupational health and safety management system is very important so as to protect employees against physical hazards, biological hazards, psychological hazards and chemical hazards that affect employees during working period. For an organization to get commitment, satisfaction and acceptability from its employees, its needs to ensure their safety needs (protection which includes the elements like security, order, laws stability and freedom from fear) are fulfilled. The theory describes that for employees to be protected, there must be laws, policies, proper administration and programmes that create healthy and safety working environment. These are regarded as occupational health and safety guidelines, programmes and administrations which reduce workplace hazards. The theory was adopted in the current study because it explains about safety needs particularly human protection at work place. Also, the current study addresses the importance of having appropriate management system that contains rules, regulations and administration in place which aims at protecting human being against accidents, injuries and work related diseases at workplace.

Empirical Review

The study reviewed several extant studies conducted by different scholars about occupational health and safety management system (OHSMS) in reducing workplace hazards. For example, Gujrath, Kale and Samir (2013), conducted a study to examine the occupational health and safety management system in processing industries. The study was conducted in Middle East countries particularly in Oman. Secondary data was used to describe the root cause of accidents and injuries in the processing industries. The study used the model of accidents causalities which must pass through five sequential conditional series which are social environment and origin, person fault, unsafe act or conditions, accidents and injury. The study revealed that policies, programmes, legal framework, planning and proper administrative control are the requirements and elements for occupational health and safety management system in reducing workplace hazards. The findings also revealed that workplace hazards are caused by poor management, insufficient training and knowledge among workers and poor decision making. Moreover, the study suggested that, in dealing with OHSMS, there is a need to review the procedures and practices which are used mostly in the industries. Aside from this, the study suggested that there should be proper redesigning of OHSMS by focusing on hazards control measures and plans for, as well as evaluation of workplace hazards. Along that, the study described the importance and needs of having proper and effective OHSMS in an organization.

Another study was conducted by Widodo et al. (2017) to determine the identification of potential hazards in manufacturing industries in Indonesia. The study used field study literature from the selected field known plant 2 Sunter whereby the data were analyzed using the Fault Tree Analysis (FTA). The study identified areas with the greatest potential hazards in manufacturing industries to be the plant casting production and plant stamping production areas. The study suggested measures to be taken like the use of personal protective equipment (PPE) and establishing good working procedures. Also, from the study it was advised that training to workers should be conducted as a normal routine and the campaign for occupational health and safety programmes, policies and regulations should be emphasized and encouraged.

The study conducted by (Zubar et al., 2016) analyzed occupational health and safety management system in manufacturing industries in India. The data were collected by using a mailed questionnaire and a framed questionnaire. The study analyzed health management, safety management, motivation, leadership, training, welfare facilities and accident statistics. Furthermore, the study analyzed occupational health and safety policy, organization and administration, hazards control and risk analysis, monitoring, and reporting measures taken in controlling hazards. The study used Graphical D and S methods to analyze the data. The study revealed that most of the industries and enterprises endeavor to implement, coordinate and maintain health and safety in their organizations and work premises. The findings further revealed that motivation, good leadership and training to employees increase commitment and responsibility of workers and reduce workplace hazards. Moreover, welfare facilities, policy and administration are elements and components in occupational health and safety management system for reducing workplace hazards in enterprises and manufacturing industries.

Moreover, Yoon et al. (2013) conducted a study that assessed the status and effect of OHSMS in construction companies and analysis of accident rates in South Korea. The data were collected by using a designed questionnaire in which 100 companies were used as the sample to represent all companies. The study revealed that, in certified companies, accidents rate was lower than that in noncertified companies.

On the same note, Mrema et al. (2015) conducted a study to describe the status of occupational health and safety in Tanzania and outline the challenges in providing occupational health services under the state of expanding economies in Tanzania. Documentary review was employed in this study in which occupational health and safety articles, statutes, International Conventional and Recommendations were reviewed. The study revealed that workers were exposed to workplace hazards and hence suffered from illnesses and injuries. This is because present regulations, laws, policies and programmes are not adequately implemented. Also, the study observed that most of workers in manufacturing companies in Tanzania are not covered by occupational health and safety services. Furthermore, the study pointed out that most of the manufacturing companies in Tanzania are still lacking occupational health and safety services due to poor technology, ineffective institutions framework that deal or implement occupational health and safety issues.

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Conceptual Framework

The empirical review of this study was guided by two main themes which are occupational health and safety management systems (OHSMS) and workplace hazards.

Occupational Health and Safety Management System (OHSMS)

OHSMS are guidelines which are used in controlling workplace hazards, programs which are used in preventing the occurrences of hazards and administration which important for management and monitoring workplace hazards. Occupational Health and safety guidelines are established to control hazards by intruding sanctions and punishment which are in the national and international laws including Occupational Health and Safety Act no. 5 of 2003, Industrial and Consumer Chemicals (Management and Control) Act No. 3 of 2003. Also, there are several occupational health and safety programs established so as to ensure workplace accidents, diseases and damages are reduced; these programs include conducting inspection, training, seminars and regular or scheduled testing and checking employees' health. Furthermore, occupational health and safety administration are introduced in order to ensure all workplace hazards are managed, monitored, controlled and evaluated. These are done through the presence of occupational health and safety committee, occupational health and safety authority and departments or units responsible for occupational health and safety at workplace.

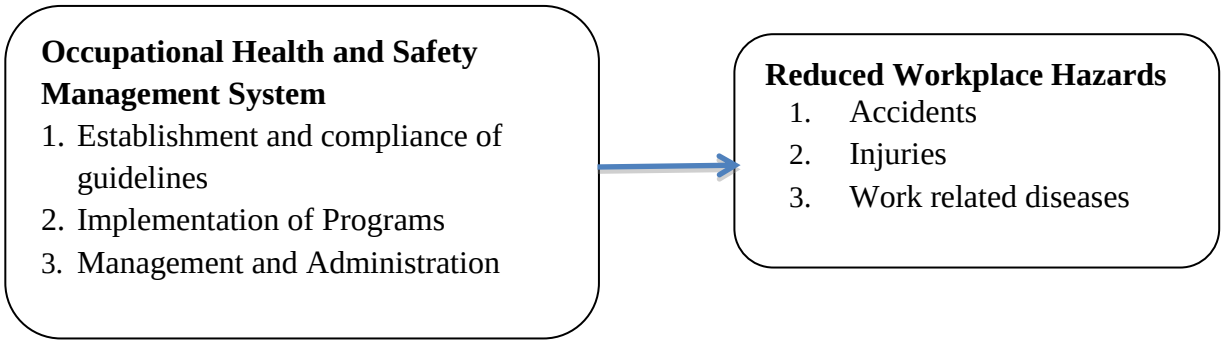


Figure 1: Conceptual Framework
Source: Synthesized from the Literature

Methodological Considerations

The current study was grounded by positivism approach in which the reality was measured quantitatively (Bhattacherjee, 2012; Saunders, Lewis, & Thornhill, 2008). In the current study, cross sectional design was employed in collecting data from five big manufacturing companies in Dar es Salaam at a single point. This helped to collect data by using sample survey about roles of occupational health and safety guidelines, programmes and administration in reducing workplace hazards which enabled to identify the causative factors and results effects of the study.

The population of the current study involved all employees of manufacturing companies in Dar es Salaam region. According to URT (2012), in Dar es Salaam region, there are 32,289 employees who are working in manufacturing companies. Therefore, the sample size was 285respondents who were conveniently and purposively selected from the population. A sample survey was employed to select big five manufacturing companies which were selected purposefully based on numbers of employees in each of these companies. Other factors considered in the purposeful selection were accessibility and convenience. From each company, 57 respondents were randomly selected.

A well-structured questionnaire was used to collect the primary data used in the current study. Copies of the questionnaire were distributed to respondents by using self-administered method. This method was supplemented by semi-structured interview which was used to get data from illiterate respondents and get more clarifications from literate ones. The structured questionnaire prepared were in Likert scale arrangement in which the information was collected from the field of study. Moreover, an indirect observation method was used to collect information regarding the presence of protective equipment, and presence of health and safety committee. After the collection of data, the data analysis was done by using Partial Least Square – Structural Equation Modeling (PLS – SEM) and descriptive statistics to describe demographic characteristics of the respondents

Analysis and Presentation of Findings

Profile of the Respondents

The profile of the respondents is described by considering sex, age, education level and the experience at work. The results show that out of 285 respondents, 70.2% were males and 29.8% were females. This shows that there were more males as compare to females. This distribution was expected in manufacturing industries since many males work in the sector as compared to females. The results further indicate that respondents with the age between 21 and 30 were 50.5%, between 31- 40 were 26.1%, 41-50 were 17.5%, while 5.6% of the respondents 51 years and above. With regards to the level of education, the findings reveal that majority (50.5%) had secondary education, 26.4% were technicians, 17.5% were university graduates and only 18.6% of the respondents had complete primary education. It can be seen that the results show a greater percentage of the respondents having secondary education followed by those who were technicians. This indicates that in manufacturing industries, many employees have secondary and technician education. Hence, these respondents had information to respond to the questionnaire provided to them. These respondents therefore provided meaningful information that increased data clarity and confidence of during analysis. It was further revealed that 72.6% of the respondents had less than 10 years of experience, 22.8% had experience between 10 and 20 years, while respondents with experience of more than 20 years constituted 4.6%. Table 1 presents the profile.

Table 1: Profile of the Respondents

Variable	Category	Frequency	Percentage

Sex	Male	200	70.2%
	Female	85	29.8%
	Total	**285**	**100.0%**
Years of respondents	21-30 years	144	50.5%
	31-40 years	75	26.4%
	41-50 years	49	17.5%
	51+ years	16	5.6%
	Total	**285**	**100.0%**
Education level	Primary level	51	17.9%
	Secondary level	115	40.4%
	Technician level	66	23.1%
	University level	53	18.6%
	Total	**285**	**100.0%**
Working experience	Less than 10 years	207	72.6%
	Between 10 and 20 years	65	22.8%
	More than 20 years	13	4.6%
	Total	**284**	**100.0%**

Occupational Health and Safety Management System and Workplace Hazards

The main focus of this paper was to examine the existing relationship between occupational health and safety management system (OHSMS) and workplace hazards. In this case, OHSMS was measured by three factors, namely guidelines, programmes and administrations. On the other hand, the workplace hazards were measured by accidents, injuries and diseases that occur at work. Accidents, injuries and diseases were theoretically considered as predictors for both occupational health and safety management system and workplace hazards. Through the use of PLS-SEM, an overall analysis of the existing relationship between occupational health and safety management system and workplace hazards was established. Specifically, three objectives guided the study, which were to examine (i) the roles of occupational health and safety management guidelines in reducing workplace hazards; (ii) the roles of occupational health and safety management programmes in reducing workplace hazards; and (iii) the roles of occupational health and safety management administrations in reducing workplace hazards. The analysis of these objectives is presented in Figure 2. However, before interpretation of these results, it is important to follow steps that are recommended for multivariate data analysis. In this case, Hair et al. (2011) proposed the following steps in interpreting and using the final results of PLS-SEM model.

> *…PLS-SEM assessment typically follows a two-step process that involves separate assessments of the measurement models and the structural model. The first step is to examine the measures' reliability and validity according to certain criteria associated with formative and reflective measurement model specification. This first step is based on the logic that if you are not confident that the measures represent the constructs of interest, there is little reason to use them to examine the structural relationships…. If the measures are shown to be adequate, however, the*

> *second step involves an assessment of the structural model estimates"* (Hair et al., 2011, p.144).

With regard to measures' reliability and validity, Hair et al. (2011) argue that reflective measurement models' validity assessment focuses on convergent validity and discriminant validity, of which for convergent validity, researchers need to examine the average variance extracted (AVE). Hair et al. (2011) further pointed out that an AVE value of 0.50 and higher indicates a sufficient degree of convergent validity, that is the latent variable explains more than half of its indicators' variance. As indicated in Table 2, the values of AVE for accidents, work related diseases and injuries were 0.668, 0.604 and 0.548 respectively. These values indicate that the latent variables explain 66.8%, 60.4% and 54.8% of variances of accidents, work related diseases and injuries respectively. Other indicators of reliability including Cronbach's Alpha (0.853, 0.869 and 0.889) and Composite Reliability (0.889, 0.879 and 0.898) evidenced very high level of reliability, which warranted the interpretation of the results as a second step. The values of rho A were also very high with all indicators, of which 0.855 appeared as the lowest. These values were considered to be very high to create no doubt for interpretation of structural model estimates.

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Table 2: Construct Reliability and Validity

Variables	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Accidents	0.853	0.855	0.889	0.668
Work related Diseases	0.869	0.869	0.879	0.604
Injuries	0.889	0.863	0.898	0.548
Administration		1.000		
Guidelines		1.000		
Programmes		1.000		

The primary evaluation criteria for the structural model are the R – square measures and the level of significance of the path coefficients, which reflect the same meaning as regression weights. Accordingly, R-square in PLS-SEM indicate that R-square values of 0.75, 0.50, or 0.25 for endogenous latent variables in the structural model can be described as substantial, moderate, or weak, respectively (Hair et al., 2011). The results, as presented in Figure 3 indicate that the value of R-square values for accidents, work related diseases and injuries are 0.617, 0.453 and 0.563 respectively. These values indicate that 61.7%, 45.3% and 56.3% of variation in accidents, work related diseases and injuries respectively are explained by independent variables (guidelines, programmes and administrations). The remaining percentages are explained by other factors not considered in the study.

Table 3: R Square and R Square Adjusted

Variables	R Square	R Square Adjusted
Accidents	0.617	0.613
Injuries	0.453	0.447
Work related Diseases	0.563	0.559

The results, presented in Figure 2, indicate that there is a negative relationship between guidelines and all indicators of workplace hazards (accidents, injuries and diseases that occur at work). This leads to the conclusion that with tight guidelines of occupational health and safety management, then fewer accidents, injuries and diseases that occur at work will occur. The results on regression weights show that guidelines indicator has values -0.157, -0.139 and -0.268 for accidents, injuries and diseases that occur at work respectively. With regards to significance of individual variable, the findings show that all values were significant at 5% level of significance (Table 4). The significant values indicate that the regression weight contribute towards reducing of work related hazards.

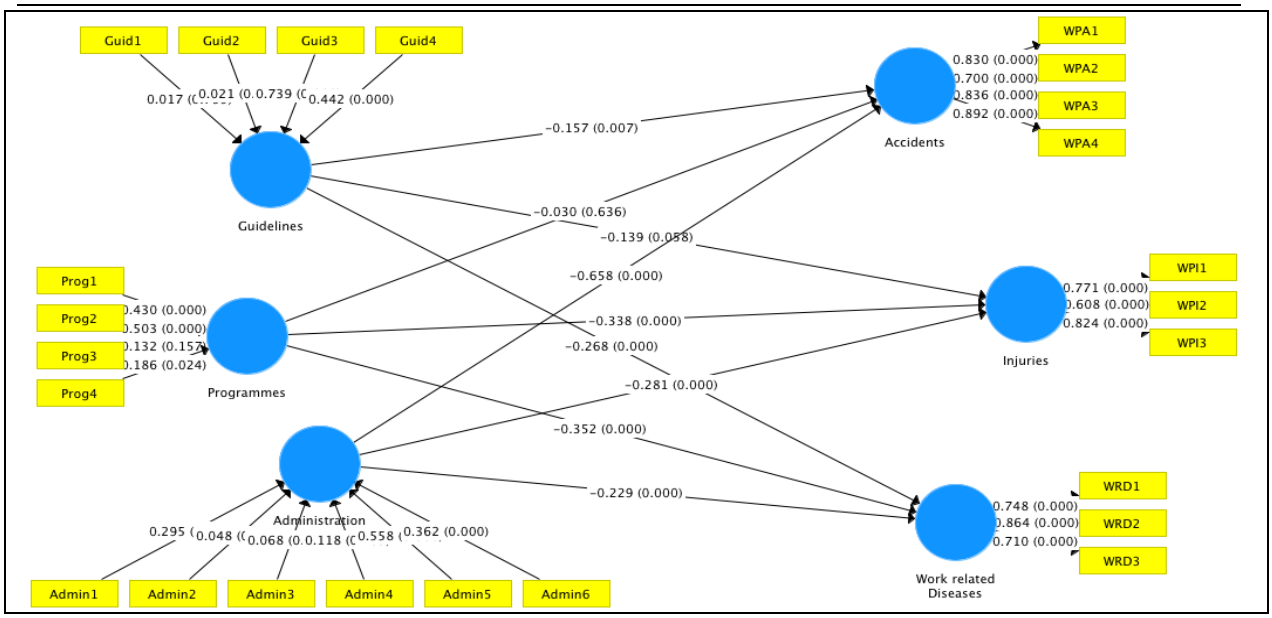


Figure 2: Path Analysis of OHSMS and Workplace Hazards

Testing for objective two also show that there is a negative relationship between programmes and all indicators of workplace hazards (accidents, injuries and diseases that occur at work). This leads to the conclusion that with well designed and implemented programmes (training and inspection) of occupational health and safety management, then less accidents, injuries and diseases will occur at work place. The results on regression weights show that programme indicator has values -0.030, -0.338 and -0.352 for accidents, injuries and diseases that occur at work respectively. With regards to significance of individual variable, the findings show that the value of programmes on accidents was not significant at 5%. Other two values were significant at 5% level of significance (Table 4). The significant values indicate that the regression weights of these variables contribute towards the reduction of work related hazards. Possible reason for insignificance value for programmes on accidents may be a negligence practice whereby accidents are not taken on serious as compared to injuries and diseases that occur at work.

Table 4: Significance of Regression Weights

Relationship	Original Sample (O)	P Values
Administration -> Accidents	-0.658	0.000
Administration -> Injuries	-0.281	0.000
Administration -> Work related Diseases	-0.229	0.000
Guidelines -> Accidents	-0.157	0.007
Guidelines -> Injuries	-0.139	0.048
Guidelines -> Work related Diseases	-0.268	0.000
Programmes -> Accidents	-0.030	0.636
Programmes -> Injuries	-0.338	0.000

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Programmes -> Work related Diseases	-0.352	0.000

The results of the current study on objective three indicate that there is a negative relationship between administration and all indicators of workplace hazards (accidents, injuries and diseases that occur at work). In this case, administration was measured by involvement of employees and the use of proper personal protective equipment. These results lead to the conclusion that strong involvement of employees and the use of proper personal protective equipment will result to less accidents, injuries and diseases at work place. The results, in Figure 2, on regression weights show that administration indicator has values -0.658, -0.281 and -0.229 for accidents, injuries and diseases that occur at work respectively. With regards to significance of individual variable, the findings show that all values were significant at 5% level of significance (Table 4). The significant values indicate that the regression weight contribute towards the reducing of work related hazards.

Discussion of Findings

Roles of Occupational Health and Safety Guidelines (OHSGs) in Reducing Workplace Hazards

The findings of the current study revealed that manufacturing companies with tight occupational health and safety guidelines reduce workplace accidents, injuries and diseases caused by work related hazards. It indicates that a company which applies and implements laws, policies and company's regulations relating to health and safety reduces workplace accidents, injuries and work related diseases. From this objective, the results indicate that for the company to reduce workplace accident, injuries and work-related diseases, occupational health and safety guidelines are important. The study observed that most of the companies have laws, regulations and policies but do not involve employees when the company set plans. This may affect the effectiveness of the application and implementation of laws and regulations in reducing workplace hazards.

Table 5 Roles of OHSGs in Reducing Workplace Hazards

S/N	Statement	Strong Disagree		Disagree		Neutral		Agree		Strong Agree	
		F	%	F	%	F	%	F	%	F	%
1	Well established OHS policies and standards reduced injuries, damages and diseases from my work setting.	4	6.2	2	3.1	13	20.0	32	49.2	14	21.5
2	Inclusive OHS plans in our company have improved safety and wellbeing of our life.	9	13.8	19	29.2	21	32.3	8	12.3	8	12.3
3	Application and implementation of laws and regulations have speeded up reducing workplace hazards in our company.	3	4.6	6	9.2	10	15.4	33	50	13	20.0
4	Our company put more priority to the compliance and implementation of OHS rules.	1	1.5	6	9.2	14	21.5	31	47.7	13	20.0

The findings are supported by a number of prior studies such as ILO (2011b); Mohammadfam et al., (2017); Qiang et al., (2020); Farouk (2017); and Georgakopoulos and Kelly (2017) that effective implementation of occupational health and safety guidelines like policies, rules and standards contribute to the reduction of workplace accidents, injuries and work related diseases. Also, they insisted that having occupational health and safety guidelines in the organization and apply them and involve employees reduce workplace hazards and increase the organization competitiveness. This is because the presence of these guidelines and involvement of workers increase workers' confidence and satisfaction while working without any fear of being harm.

Roles of Occupational Health and Safety Management Programmes (OHSPs) in Reducing Workplace Hazards

The findings of the current study in the second objective revealed that well designed and implemented programmes like training, seminars, inspection and testing employees' health contribute positively to the reduction of workplace accidents, injuries and diseases caused by work related hazards. It was discovered that a company with scheduled timetable for testing employees in the company improves employees' health and wellbeing. Also, it was indicated that training, seminars and conducting of inspection on health and safety at workplace reduce the occurrence of accidents, injuries and damages of properties. The results are supported by Dev, Dominick, & Nkolimwa, (2019); Manyele et al. (2008); Mrema et al. (2015); and Yoon et al. (2013) who pointed out that a company which provides training to employees on how to handle and deal with health and safety issues like personal protective equipment and the use of machines protects employees against workplace hazards like accidents, injuries and work related diseases.

Table 6 Roles of OHSPs in Reducing Workplace Hazards

S/N	Statement	Strong Disagree		Disagree		Neutral		Agree		Strong Agree	
		F	%	F	%	F	%	F	%	F	%
1	Scheduled timetable for testing employees' health improves employee's health.	4	6.2	7	10.8	19	29.2	24	36.9	11	16.9
2	Conducting OHS training and seminars gives us awareness on how to protect ourselves against workplace hazards.	4	6.2	12	18.5	17	26.2	22	33.8	10	15.4
3	Inspections on equipment and infrastructures ensure the safety and security of employees and properties.	14	21.5	20	30.8	14	21.5	14	21.5	3	4.6
4	Conducting physical and mental rehabilitation to	4	6.2	9	13.8	21	32.3	23	35.4	8	12.3

	employees is important for HS to us.

This is because both employer and employees are trained on how to overcome or refrain from avoidable hazards that are caused by human faults. Also, regular inspection on equipment and infrastructures ensures safety of employees and properties. Moreover, the study indicated that physical and mental rehabilitation to employees is important for employees' health and safety.

The Roles of Occupational Health and Safety Administrations (OHSA) in Reducing Workplace Hazards

The findings of the current study indicated that involvement of employees on issues relating to occupational health and safety is important for reducing workplace hazards. It was indicated that stable and cooperate administration that insist the use of laws and personal protective equipment contribute to the reduction of workplace accidents, injuries and work related diseases. Also, the findings indicate that a company with organizational structure which includes occupational health and safety unit or department controls and minimizes workplace accidents, injuries and work related diseases. Also, it was revealed that presence of occupational health and safety committee reduces the occurrence of workplace hazards. This is due to the fact that the responsible unit and committee control hazards by identifying hazards, control measures to be taken and evaluate hazards in terms of probability of occurrence and the extent of risk. In this way, work place hazards like accidents, injuries, damages of properties and work related diseases are reduced.

Table 7 The Roles of OHSA in Reducing Workplace Hazards

S/N	Statement	Strong Disagree		Disagree		Neutral		Agree		Strong Agree	
		F	%	F	%	F	%	F	%	F	%
1	Well established OHS section/committee are important for health and safety issues.	8	12.3	12	18.5	13	20	12	18	20	30.8
2	Involvement of employees in OHS plans, objectives is vital for employees and company's wellbeing.	9	13.8	2	4.6	13	20	20	30.8	21	32.3
3	Appropriate tools protect employees from workplace hazards.	4	6.2	6	9.2	12	18.5	35	53.8	8	12.3
4	Good management structure facilitates the compliance of OHS legal framework and programs.	4	6.2	8	12.3	13	20	27	41.5	13	20

These findings were maintained by Amponsah-tawiah and Mensah (2016); Kgalamono, Mwila, Moyo & Zungu (2015); and Dawson & Harrison (2016) who pointed out that any organization should ensure the involvement of workers, create specific unit and formulate the committee that

deals with all issues related to occupational health and safety. This will reduce workplace hazards because employees are aware where to go or to report for any issue. Furthermore, Sklad (2019) pointed out that effective participation of workers and leadership in occupational health and safety cement the minimization of workplace hazards.

Therefore, occupational health and safety management system are important in reducing workplace hazards (Georgakopoulos & Kelly, 2017). This is due to the fact that in reducing workplace accidents, injuries and work-related diseases, manufacturing companies should ensure occupational health and safety guidelines, programmes and administration are properly established and implemented as demonstrated in the adopted theories like Henrich's Domino and Maslow hierarchy of need theories.

Limitations of the Study

Occupational health and safety management system (OHSMS) is the area which is not studied by many researchers; so it has limited information specifically from Tanzania. Therefore, the researchers of the current study reviewed many literatures from outside Tanzania which enabled them (researchers) to identify research gap which was filled by conducting the current study. Also, there were non-responses from the respondents due to the fact that many employees thought that the information could harm their employment. However, this was settled by seeking permission from the employers and insuring the respondents that it was for academic purpose and no any personal information was required.

Conclusions and Implication

The current study focused mainly on assessing the roles of occupational health and safety management system (OHSMS) in reducing workplace hazards. It was specifically guided by three objectives including identifying the roles of occupational health and safety management guidelines, programmes and administrations in reducing workplace hazards. The findings of the current study revealed that occupational health and safety guidelines, programmes and administrations contribute positively to the reduction of workplace accidents, injuries and work related diseases. The use and implementation of OHSMS reduce workplace hazards. The reduction of workplace hazards lead to social, companies' and national development because health and wellbeing of employees who constitute society will be protected, the profit of the company will be increased and there will be an increased national income and stability.

The findings of the current study suggest that training, seminars and awareness should be provided to both employers and employees because some companies have OHSMS and workplace hazards are increasing. Also, the government and manufacturing companies should establish and implement strong and well-designed occupational health and safety guidelines, programmes and administrations that will reduce workplace accidents, injuries and diseases related to work. Moreover, the study will provide the insights to various companies and other stakeholders on the way to reduce workplace hazards particularly in manufacturing companies.

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