

Safety management systems, ergonomic features and accident causation among garment workers.

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ABSTRACT:

Introduction- Issues of Occupational Health and Safety and productivity of work in developing countries have been found to be associated with poor understanding of and training in ergonomics and safety management systems in the work place. Safety management systems are created to increase performance by reducing the likelihood of illness, death, absenteeism, injury and other unpleasant outcomes for workers. An occupational illness or accident can affect production. Accidents can have immeasurable indirect cost to workers such as the human suffering caused to families of workers, which cannot be compensated with money. In addition, they take a big toll on the company in the event of such. While workplace safety conditions and standards are shaped by a nation's health and safety legislation and an organization's safety culture, strong commitment from management and strong employee involvement are also essential elements for a successful workplace health and safety system. Understanding and applying ergonomic principles in the work place also helps prevent injuries and increase productivity.

Aims:- This study explored ergonomics features in the workplace, safety management systems practiced and the relationship between types of accidents encountered in the garment industry in the Export Free Zone (EFZ) in Accra, Ghana.

Method: - Stratified and convenience sampling methods were used to select 300 participants from 945 garment producers. A self-administered structured questionnaire was used to assess safety system practiced and ergonomics features in the garment workplace. It consisted of close-ended statements that required respondents to rate information on a 3-point Likert scale to specify their level of agreement or disagreement on information and descriptions on safety systems and ergonomic features in their workplace. The questionnaire also elicited

information on accidents encountered in the workplace. The **independent t-test** was carried out to test the level of significance of relationships among selected study variables.

Results: - Majority of the respondents were young females, with low educational qualifications. The rating of practices and attitudes towards safety management systems in the workplace by the employees were mostly unfavorable. While lighting, ventilation, noise and temperature were rated by employees (60% in each case) as comfortable, only 18% agreed they did have ergonomically designed seats. Findings indicated that employees who were exposed to poor ergonomic practices in their workplace were more likely to suffer cuts, burns, falls and loss of fingers compared to their counterparts exposed to sound ergonomic practices in the workplace. Thus, workers experience high levels of accidents when there are poor ergonomic practices in the workplace.

Conclusion: -Ergonomic intervention strategies and safety systems that aim to minimize the risks of accidents should be provided by employers and occupational health service providers to help increase productivity in the work place.

Keywords: garment producers, accidents, safety management, Ghana.

1. Introduction

Workers' health and safety and well-being at the workplace is a subject of interest to numerous people and despite the efforts being made throughout history to control hazards to prevent unsafe and unhealthy exposure and also to improve labour relations and conditions, poor working conditions still persist. Promoting the health and safety of employees is not only a good thing in itself as a moral imperative, but it also promotes the well-being of the organizations for which they work. The clothing industry is generally seen relatively as a safe place to work as compared with other industries. The major health risks come from more subtle hazards whose effect accumulates over time and lead to fatigue, pain and musculoskeletal disorders (Gunning et al., 2001; Chavalitatsakulchai and Shahnavaz, 1993). In these modern times, the textile and garment industry are still the cornerstone of many economies worldwide as a number of countries still depend heavily on it for a large proportion of their total export. Research has consistently found that garment companies are relatively easy to set up and policymakers therefore see this sector as a quick way to generate employment for lots of people (Hale and Shaw, 2001; O'Rourke 2003). Countries pursuing export-led industrialization typically follow strategies that encourage the involvement of foreign capital and often set up Export Free Zones (EFZ).

In the EFZs in South-East Asia, the Caribbean and Mexico, for instance, which are involved in global chain supply of apparel, workers are often faced with poor work and work environment. Working conditions for the majority of workers worldwide do not meet the minimum standards and guidelines set by the International Labour Organisation (ILO) and the World Health Organisation (WHO) for

Occupational Health and Safety (OHS) and social protection (Goldstein et al., 2001). In most of the third world economies, there are often no stringent laws governing the setting up. The running and maintaining of a certain level of working standards ethics within the garment industry here are often not supported by a legislative framework, or the laws, if they exist, are not enforced or they are flouted. The employer therefore neglects the care and the welfare of their employees (Brown, 2002; Yardley, 2013).

Various international community especially ILO, governments, and other stakeholders exhibit such intense interest in ensuring and enforcing OHS at every work place. It includes healthy working conditions for workers, their protection from risks adverse to health, and the maintenance of an occupational environment adapted to workers physiological and psychological capabilities (ILO 2009). Poor occupational health and labour practices in the garment industry have increased partly as a result of Global sourcing of garments from suppliers in low-wage countries through supply chains from developed countries.

Provisions of Safety Management System (SMS), ergonomic considerations in the workplace, and a positive safety culture have all been known to aid both productivity and workers' health. An SMS is intended to act as a framework to allow an organization, as a minimum, to meet its legal obligations under occupational health and safety law (ILO, 1996). If it exists in a garment company, it provides guidance on the development of both national and tailored guidelines on OHS management systems to respond appropriately to the real needs of organizations, according to their size and the nature of their activities. It provides a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective in the workplace. As the manner in which safety is handled, it includes how policies and procedures are implemented by goal setting, planning, and measuring performance of health and safety in the work place (National Accreditation Board for Hospital, 2011). At the organizational level, compliance to OHS laws and regulations is the responsibility and duty of any employer though it is the responsibility of governments, as well as employees to create a healthy and safe work environment. Therefore, the employer should demonstrate strong leadership and commitment to OHS activities and the establishment of an OHS management system in the workplace (ILO-OSH, 2001). Thus, such policy should also ensure that the same level of safety and health requirements applies to contractors and their workers, including temporary workers in garment manufacturing.

Research has consistently found that the physical characteristics of the job of the machinist in garment production are an important risk factor for muscle pain and injury. The risks of musculoskeletal pain (MSPs) have often been linked to conditions such as unsuitable chairs, awkward postures and to other poor ergonomic practices (Chavalitatsakulchai and Shahnavaz, 1993). A previous study by Vandyck and Fianu (2012) in Ghana, reported that seats dressmakers and tailors sat on were often a big problem. Non-

adjustable seats that had no backrest, seat pads and properly contoured seat pans were used and the height and depth of seats did not meet standards recommended in the literature. Garment workers are also known to encounter health problems associated with overcrowding, pollution, poor lighting and ventilation, non-ergonomic workstations, excessive noise, vibration, and non-use of personal protective equipment, among others (Parimalam et al., 2006).

It is believed that if employers and workers are able to build a workplace culture where effective health and safety is an integral part and employees believe that safety behaviors will lead to values outcomes, they will be motivated to comply with safety procedures and participate in safety activities as noted as far back as in 1964, by Vroom. When employees work in an environment in which safety is a concern, they reciprocate by complying with established safety procedures. Wiegmann et al. (2007) reported that organizational commitment (such as upper management attitude towards safety and compliance with international and national safety laws), operational personnel (such as supervisors and trainers), formal safety system (such as safety audits and reporting system), informal safety system (such as professionalism and accountability) are important components of the safety culture of any given organization

In the UK, health and safety legislation was drawn by the Health and Safety Executive and the local authorities under the Health and Safety at work Act 1974. It is regularly updated and appended. In the U.S.A. the passing of the Occupational Safety and Health Act of 1970, was the means by which industries were forced to adopt standards to ensure a safe and healthy environment for workers. These acts guarantee employees the right to a safe and healthy environment and inspectors with wide-ranging powers can walk in and inspect workplaces at any time.

Like most developing countries pursuing export-led industrialization, Ghana set up EFZ where the bureaucracy surrounding importation and exportation was curtailed. The EFZ offers incentives including tax holidays in the hope of attracting new businesses and foreign investment (Ghana Free Zone Board, 2012). The development of the garment industry and the establishment of the EFZ is a move towards an advanced and high-income economy. As a priority for employment generation and foreign exchange earnings, the government of Ghana inaugurated the President's Special Initiative (PSI) on Garment in 2001 and joined the list of beneficiaries to the African Growth and Opportunities Act (AGOA) in 2002. The PSI on garment is a strategy to establish 100 Ghanaian-owned medium-sized companies, attract foreign large-scale garment producing companies to invest or relocate to the newly created garment village in Ghana's EFZ and build a large pool of sub-contractors working under merchant exporters (Ghana News Agency (GNA), 2001). To safeguard the welfare of workers in the textile and garment industry in Ghana, a number of Ministries, Departments and Agencies have been charged with enforcing and overseeing the compliance of OHS and labour standards in the industry. They share the responsibility for the

regulation and the promotion of OHS (Clark, 2009; Tetley, 2003). They are empowered to provide best practice information and guidance to assist Ghanaian businesses with health and safety in the workplace. Particularly, the FID and the Department of Labour are empowered to inspect workplaces to check on safety and health arrangement, investigate accidents at work, and make sure that employers and employees comply with health and safety legislations (Labour Act 2003, Act 651, and Factories, Offices & Shops Act 1970, Act 328). Non-compliance with these legal requirements can lead to prosecution and a fine. However, some of these laws might be inadequate and limited in scope because they are outdated (Clark, 2009). Prudent development policies require health monitoring tailored to evaluate potential risk of the new EFZ garment industries to ensure that adverse health changes in the population do not emerge as a consequence of the new forms of employment. Whether the benefits generated by the garment industry within Ghana's EFZ towards poverty reduction can be sustained in the long run may depend on Ghana's ability to address a number of possible challenges and constraints including health and safety and labour practices of garment producers.

2. Aims and Objectives

This study explored ergonomics features in the workplace, safety management systems practiced and the relationship between types of accidents encountered in the garment industry in the Export Free Zone (EFZ) in Accra, Ghana. The objectives were specifically to

- Assess ergonomics features in the workplace
- Determine safety management system practised in the garment industry
- Investigate type of accidents that occurred in the workplace
- Determine relationship between ergonomics features and accidents encounter in the garment industry

3. Method:

From seven (7) different garment manufacturing companies in the EFZ, a sample of 300 employees were selected from a population of 815 workers by proportionate stratified sampling technique, followed by convenience sampling methods to obtain the participants. The study employed a cross-sectional design with a mixed method approach where both quantitative and qualitative data were collected from participants. A self-administered structured questionnaire was used to assess safety system practiced and ergonomics features in the garment workplace. It consisted of close-ended statements that required respondents to rate information on a 3-point Likert scale to specify their level of agreement or disagreement on information and descriptions in their workplace. The questionnaire also elicited information on accidents encountered in the workplace. Clearance was sought from the Institutional Review Board and the research was reviewed, approved and awarded the Ethical Clearance Certificate. Permission to use the companies for the study was sought from management of the companies (mostly the CEOs). Convenient times for the data collection were arranged with the employers and the

employees. To characterise Safety management systems, ergonomic features and accident among garment workers a total of 17-item scale was developed to gauge the employees' assessment about workplace. A Cronbach Alpha recorded from the reliability assessment was Safety systems (0.879) and Ergonomics (0.640). Inferential and descriptive statistics were used to analyze the data to address the objectives of the study. The independent t-test was carried out to test the level of significance of relationships among selected study variables at $p < 0.05$.

In this article, we first review the literature that serves to define health and well-being. We then discuss the primary factors associated with health and well-being, the consequences of low levels of health and well-being, and common methods for improving health and well-being in the workplace. Finally, we highlight important future directions for future theory, research, and practice regarding health and well-being from an organizational perspective.

4. Results

Sample Characteristics:

The majority (81%) of the participants were young adults between 21 and 35 years of age with 36%, 39% and 17% having completed first cycle (primary), second cycle (secondary) and tertiary (Teacher training college, Polytechnic, University) institutions respectively. The length of time respondents had been employed in their respective factories varied- from two months to a maximum of 4 years with a mean of 1½ years. While 87% of the respondents were females, 13% were males. Seventy seven percent were single and 97% of the respondents were machinist and about 6% were quality control and 4.3%, packaging and trimming workers. Less than 2% each reported as designers, pattern makers, cutters and supervisors. Some supervisors, designers, pattern makers, cutters and sometime machinist doubled as quality control, trimming or packaging workers. Since safety management systems, ergonomic features and accident among garment workers were the main study variables results were presented accordingly.

Safety management systems

The rating of practices and attitudes towards safety management systems in the workplace by the employees were mostly unfavourable. Less than 33% of employees agreed a number of safety management systems operated in their workplace. For instance, a culture of safety is paramount in the workplace (32%); management discusses health and safety issues with employees (31%); workplace safety is paramount because management pays attention to health and safety in equipment, management and work practices (30%); availability of work and safety contact at work (27%); there is access to injury related medical care (26%); existence of controls to eliminate hazards after identifying them (25%); appropriate training in occupational health and safety is given (22%); and information and supervision is given on occupational health and safety (22%).

The respondents agreed that; there were clearly specified responsibility for cleaning work area and walkways (77%); floors had been demarcated to avoid obstruction in case of fire (74%); hazards were promptly reported to management (47%); they occasionally had fire drills and were instructed on what to do in case of fire (41%); and employees will not be perceived as trouble makers when they report work hazards to management (40%).

Accidents are often preceded by a chain of circumstances and events that would have warned of a potential danger. An ingenious and shrewd management always encourages workers to report all potential hazards or near miss accidents. Each report should be taken seriously, investigated and preventive actions taken. If however less than 50% of employees promptly report hazards to management and 50% employees felt they would be perceived as trouble makers when they report work hazards to management, then proactive measures are likely lacking. Employers might not be warned of potential danger to help improve working procedures, to change or to improve equipment, as well as to modify employee behaviour to prevent accidents. The best way to stay cautious is "to gather the right kind of information", by creating an informed culture to keep a safe workplace. Moreover, when workers are allowed to participate in decision making, it may foster a more cooperative attitude between management and workers and also among workers. They may become more committed to their work if they see some of their own ideas put into practice. They may work more efficiently if they are well informed about the reasons for decisions concerning their work environment and the way their work. Very few respondents (22%) reported that appropriate training in OHS was given. Young and inexperienced workers with little knowledge and lack of safety training may increase injury risk at the workplace.

Ergonomic features

The respondents (95%) agreed that there was lighting, ventilation (86%), available space (70%), comfortable temperature (59%) and comfortable noise level in the workplace (57%). However, 18% employees agreed they had ergonomically designed seats. Hazards such non-ergonomic work stations have also been noted to be part of poor working environment of workers (Jennings, 2001; ILO, 1996; Parimalam et al., 2006; Vandyck and Fianu 2012).

Accident among garment workers.

Table 1, presents a summary of the means and standard deviation for the various types of injuries suffered and the corresponding ergonomics practices.

Type of Injury		N	M	SD
Cuts	No	238	16.31	3.29
	Yes	62	12.87	2.99
Burns	No	137	16.11	3.82
	Yes	163	15.17	3.19
Electric Shocks	No	130	15.71	3.01
	Yes	170	15.51	3.87
Falls	No	161	16.81	2.70
	Yes	139	14.19	3.83
Trapped into Machines	No	274	15.68	3.70
	Yes	26	14.69	3.49
Loss of Fingers	No	280	15.73	3.81
	Yes	20	13.80	3.47
Table 1, the means and standard deviation				

Further analysis using the independent t-test (see Table 2) revealed significant differences in the ergonomic practices in terms of cuts [$t(298) = 7.452, p < 0.05$], burns [$t(298) = 2.333, p < 0.05$], falls [$t(298) = 6.902, p < 0.05$], and loss of fingers [$t(298) = 2.384, p < 0.05$]. However, no significant differences were reported for electric shocks [$t(298) = 0.478, p > n.s$] and being trapped into machines [$t(298) = 1.374, p < 0.05$]. This implies that good ergonomics practices are more likely to result in less injury or prevent injuries such as cuts, burns, falls and finger loss in the workplace.

Thus, findings indicated that employees who were exposed to poor ergonomic practices in their workplace were more likely to suffer cuts, burns, falls and loss of fingers compared to their counterparts exposed to sound ergonomic practices in the workplace. Thus, workers experience high levels of accidents when there are poor ergonomic practices in the workplace.

Table 2: Summary of Results of the independent t-test on ergonomics and the various forms of injuries recorded			
Type of Injury	t	df	p
Cuts	7.452	298	< 0.05
Burns	2.333	298	< 0.05
Electric Shocks	0.478	298	n.s
Falls	6.902	298	< 0.05
Trapped into Machines	1.374	298	n.s
Loss of Fingers	2.384	298	< 0.05

5. Discussions

To assess attitudes and behaviour of employers to meet the safety and labour requirements variables rated by employees included safety management systems and ergonomics in the workplace. Strong

commitment from management and strong employee involvement are essential elements for a successful workplace health and safety system. Safety management systems are created to increase performance by reducing the likelihood of illness, death, absenteeism, injury and other unpleasant outcomes for workers. Accidents are often preceded by a chain of circumstances and events that would have warned of a potential danger. An ingenious and shrewd management always encourages workers to report all potential hazards or near miss accidents. Each report should be taken seriously, investigated and preventive actions taken. If however less than 50% of employees promptly report hazards to management and 50% employees felt they would be perceived as trouble makers when they report work hazards to management, then proactive measures are likely lacking. Employers might not be warned of potential danger to help improve working procedures, to change or to improve equipment, as well as to modify employee behaviour to prevent accidents. The best way to stay cautious is "to gather the right kind of information", by creating an informed culture to keep a safe workplace. Moreover, when workers are allowed to participate in decision making, it may foster a more cooperative attitude between management and workers and also among workers. They may become more committed to their work if they see some of their own ideas put into practice. They may work more efficiently if they are well informed about the reasons for decisions concerning their work environment and the way their work. Very few respondents (22%) reported that appropriate training in OHS was given. Young and inexperienced workers with little knowledge and lack of safety training may increase injury risk at the workplace.

With only 22% employees with appropriate training in occupational health and safety, the majority of employees were at risk of constant accidents; especially as many employees were young and inexperienced. Workers' involvement in planning and running the company's OHS management system is vital (ILO-OSH 2001). The best-framed OHS regulations will have little impact if the people most directly concerned, are unable to collectively defend their interests. Employees could take pro-active measures to identify workplace risk and hazards in order that preventive measures could be implemented to reduce or eliminate associated injury or illness to employee.

Having good visibility of the product and equipment is important for increasing production, reducing defective products and preventing visual fatigue, headaches and accidents among employees. Proper ventilation, space, comfortable temperature and a comfortable noise level in the workplace are also essential for efficient production and safety. Ergonomics is important for employees in garment manufacturing because they are expected to maintain a quicker pace of work, at faster assembly line speeds. Work in the apparel industry involves repetitive actions, awkward or static postures, use of excessive force and vibration to perform task. Often managers may have limited financial resources for ergonomic intervention proposed to solve a problem. Industries the world over, though may be suffering from the economic downturn, should not make excuses to cut corners

on health and safety as in such competitive environment as the garment industry, the ability to demonstrate effective health and safety management would be all the more important in winning future business.

Injury or accident can affect job satisfaction, stress and production. It can have immeasurable indirect cost to workers such as the human suffering caused to families of workers, which cannot be compensated with money. In addition, they take a big toll on the company in the event of such

Generally, the frequency of accidents found by this study seems high, but the severities were unknown since the question to assess severity was not asked of the respondents. The incidence of cuts was however high, and may involve trimming scissors and incised wounds caused by needle and pin pricks among others. Accidents like cuts are not surprising since garment production involves a lot of cutting. These accidents and injury types are typical of a garment factory as noted by Hiba (1998) in a manual aimed at improving working condition and productivity in the garment industry. Hiba [(1998)] *ibid* stated that the most common accidents encountered in the garment industry are cuts, burns and stitching of fingers. Burns in this study reported less than 15%, but relatively high. The types of accidents and injuries respondents encountered were similar to those reported in studies by Calvin and Joseph (2006) and Lu (2009) in garment establishments in Bangalore and the Philippines respectively. In those studies, stitching of fingers, cutting and bruising of hands and needle pricks were mentioned and the accidents and injuries were attributed to a poor safety culture. Accidents and injuries respondents encountered were neither recorded in the factory register or to the office of Factory Inspectorate Division as required by law. Calvin and Joseph (2006) reported similar findings in Delhi, Thailand, and Sri Lanka, where accidents were not recorded.

The fundamental values and beliefs of garment industry employers can potentially influence attitudes to safety. Accidents can be avoided if attention is drawn to unsafe practices that make workplaces hazardous, and thus investing in safety to prevent the occurrence of hazardous conditions that would eventually lead to accidents. Employees should be trained to identify risk, use tools safely, adopt safety attitudes and acquire safety knowledge to take care of safety in their workplace. Though no life-threatening injuries seem to occur, there is the need to attend to these mentioned injuries with special caution especially when there is blood involved.

Based on the summary of results of the independent t-test on ergonomics and the various forms of injuries recorded, findings indicated that employees who were exposed to poor ergonomic practices in their workplace were more likely to suffer cuts, burns, falls and loss of fingers compared to their counterparts exposed to sound ergonomic practices in the workplace. Thus, workers experience high levels of accidents when there are poor ergonomic practices in the workplace.

6. Conclusion : -

In conclusion, garment-manufacturing companies in Ghana's Export Free Zone (EFZ) partially engaged in "best practices" that promoted employees' wellbeing since employers seemed to have assumed responsibility for the provision of safety management systems and Ergonomic features for workers except for ergonomic designed seats. Since workers experience high levels of accidents when there are poor ergonomic practices in the workplace, ergonomic intervention strategies and safety systems that aim to minimize the risks of accidents should be provided by employers and occupational health service providers to help increase productivity in the work place.

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