Agro-industrial accidents linked to length of service, operation site and confidence in employer adherence to safety rules

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Research article

Keywords: occupational health; hazard, occupational accident; occupational safety and health.

Posted Date: September 5th, 2019

DOI: <https://doi.org/10.21203/rs.2.13933/v1>

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Version of Record: A version of this preprint was published at BMC Public Health on April 30th, 2020. See the published version at <https://doi.org/10.1186/s12889-020-08733-2>.

Abstract

Background Agriculture consistently ranks among the most hazardous occupational industries globally with high risk of job-related injuries, illnesses, disability, and death. In 2015, the agricultural fatal work injury rate in the United States was 22.8 per 100,000 full-time equivalent workers; seven times the all-worker fatal injury rate of 3.4 per 100,000 full-time equivalent workers. In this study we identified those factors that are associated with workplace accident and injuries at the Goldtree (SL) Limited Company- a private international agro-industrial palm company operating in Sierra Leone.

Methods This is a descriptive research that made use of both qualitative and quantitative research technique to collect occupation related accident and injuries from workers at the Goldtree (SL) Limited Company international palm oil producing and marketing company in Sierra Leone. We analyzed the responses of 100 workers at the Goldtree (SL) Limited Company regarding their work safety, adherence to work safety guidelines as well as working habit.

Results Thirty nine (39.0%) of the workers interviewed in this study said they had been involved in some forms of occupational accident; (33.3%) of those involved in some form of occupational accident have been working in the company for 3 – 5 years, 22.0% have been working at the company for at least 2 years; 7.7% have been working for 6 – 8 years ($\chi^2 = 9.88$, $p\text{-value} = 0.02$).

Conclusion Workers who have spent few years in the job, have confidence that management is committed to addressing health and safety issues, believed that their working tools were in excellent condition, or agreed that they have rights and responsibilities for an effective workplace health and safety system have decreased odds of experiencing occupational accidents or injury.

Background

The Occupational Safety and Health (OSH) management system was developed by the International Labour Organization (ILO)¹ and is internationally recognized by governments, employers and workers as an important tool that can be used to eliminate occupational hazards and risk. OSH also proffers occupational risk preventive measures as well as enhances worker's productivity. In the agricultural sector, it is postulated that OSH issues exist because of the hazards present, ignorance of job hazards, illiteracy, and/or non-existent or inadequate training.² According to Demirbas and colleagues, the knowledge level of farmers on OHS hazards and their perceived risks, attitude and behaviour towards job safety are crucial during farming activities.³ Most farms lack documented OSH policy since they do not operate in an organisational context. Cooper reported that farmers in England have unfavourable attitude towards OSH issues despite being aware of the potential risks associated with their jobs.⁴ Until 2000 agriculture sector was one of the largest labor force globally⁵ and with its use of wide range of working tools, livestock, plants and human labor, agriculture sector workers encounter high occupational risk. The ILO estimates that more than 170,000 deaths are associated with agricultural work annually.⁶ Missikpode et al ranked the agriculture sector as the most hazardous occupational industries

globally.⁷ In 2015, the agricultural fatal work injury rate was 22.8 per 100,000 full-time equivalent workers - nearly seven times the all-worker fatal injury rate of 3.4 per 100,000 full-time equivalent workers.⁸ While this statistics is high, it has been reported that the rate of nonfatal occupational injuries in agriculture is largely underestimated.⁹ The growing occupational accidents within the agriculture sector calls for the thorough implementation of OSH guidelines. OSH management practices can be expensive but its outcomes can influence workers' productivity, and hence the profitability and competitiveness of a company. In Sierra Leone like in many other countries with OSH policy, there is a missing link between human resources management and OSH for workers in many companies. This missing link is due primarily to the paucity of research data linking human resources management practices, work place improvement and safety measures.

In this study we assessed the effectiveness of the OSH management practices being implemented by Goldtree (SL) Limited Company which is operating in eastern Sierra Leone. We also identified those factors that are responsible for workplace-related accidents or injuries at the company and examined both employees and employer's perceptions of OHS management practices.

Methods

Research settings

Goldtree (SL) Limited Company is a Sierra Leone registered international palm oil producing and marketing company located near Daru in Kailahun District, eastern Sierra Leone. The oil mill site is located about 370 km from Freetown and about 60 km northeast of Kenema (Figure 1). The company has its plantations located in the following five (5) key locations within Jawei and Malema chiefdoms of Kailahun district; Daru, Tovaima, Lower Jawei, Dambala and Kpangiemba

Figure 1. Map of Goldtree Limited Company, Sierra Leone concession areas

A map showing Goldtree Limited Company, Sierra Leone concession areas in eastern Sierra Leone

Study subjects and ethics review

This is a cross sectional study that administered questionnaires to 100 employees who were attached to various locations and departments at Goldtree (SL) Limited Company. The staffs were both permanent and contracted employees of the company. Interviews were conducted and questionnaires administered to amass valid and reliable qualitative information. To check for accuracy, completeness of data and ensure quality, questionnaires and interview guide was numbered serially.

The Sierra Leone Ethics and Scientific Review Committee (Opinion Date March 29, 2017) and the Goldtree (SL) Limited private oil palm company operations provided ethical clearance and approval respectively for this study. The employees also assented through signing the informed consent statement. The R

software data analytical programme (version 3.3.10) and Microsoft excel were used to analyze the data obtained.

Results

Study Subjects

More (71%) men than women took part in this study; majority (64%) of the workers interviewed were below 35 years, few (12%) were between 40 - 50 years and above. Majority (72%) of the workers were married; 17% were single, 3% divorced, 3% separated and 5% were widowed (Figure 2). Only 14% of the workers had tertiary level education; 39% had secondary level education, while 26% had primary level education (Figure 3).

Figure 2: Distribution of workers of Goldtree (SL) Limited Company based on their marital status

Majority (72%) of the workers were married; few (3%) were divorced and separated respectively.

Figure 3: Distribution of workers of Goldtree (SL) Limited Company based on their educational status

Eighty percent of the workers at Goldtree (SL) Limited Company had some form of education; only 20% had no education.

Length of service of workers

There was an inverse correlation between the duration spent working at Goldtree (SL) Limited Company and the number of workers for that duration of time spent at the company; 43% of the workers had spent 3 – 5 years at their various departments; 12% had spent 6 - 8 years, while 7% had spent more than 8 years at their department (Figure 4).

Figure 4: Distribution of workers of Goldtree (SL) Limited Company based on their length of service

Majority of the workers have spent 0 – 5 years at Goldtree Company.

Workplace accidents, injuries and reporting

Majority (61%) of the workers did not encounter any form of occupational accidents or injuries during the period under review while 92% of the workers who encountered workplace accidents or injuries reported them immediately they occurred. Of those workers (n = 39, 39%) who encountered workplace accidents or injuries, 38.5% attributed their accident to the lack of adequate safety gears; (10.4%) inadequate training, 12.8% ignorance about OHS matters, (10.3%) workers non-compliance and carelessness, (2.6%) improper housekeeping of working tools, and (25.4%) a combination of all the above factors (Table 1).

Table 1: Factors responsible for workplace accidents or injuries among workers at

Goldtree (SL) Limited Company

Factors associated with workplace accidents and injuries	Responses	Percentage (%)
Lack of adequate safety gears	15	38.4
Lack of adequate training	4	10.3
Worker's ignorant on OHS matters	5	12.8
Worker's non-compliance and carelessness	4	10.3
Poor housekeeping and unsafe workplace	1	2.6
All of the above	10	25.6
Total	39	100.0

Majority (38.4%) of the occupational accidents at Goldtree (SL) Limited Company were associated with lack of adequate safety gears.

Likelihood of a workplace accident

We used logistic multivariate regression analysis to determine the odds of occupational accidents or injuries occurring at Goldtree (SL) Limited Company based on industrial and human factors. Workers who have spent 3 - 5 years on the job (AOR = 2.22, $p = < 0.05$), mill department workers (AOR = 3.31, $p = < 0.05$), believed that the management is committed to addressing health and safety issues (AOR = 2.49, $p = < 0.05$), believed that their working tools were in excellent condition (AOR = 3.13, $p = < 0.05$), or believed that they have rights and responsibilities of ensuring an effective workplace health and safety management including compliance to OHS measures, the right to refuse unsafe work and reporting occupational accident to the company's management (AOR = 1.11, $p = < 0.05$) have decreased odds of experiencing occupational accidents. Additionally, holding other covariate in the model constant, the odds of experiencing occupational accidents was elevated among workers who believed that management's commitment to providing the appropriate personnel to handle health and safety issues was a challenge (AOR = 7.57, $p = < 0.05$) in the company.

Table 2: Multivariate logistic regression analysis of factors associated with occupational accident Goldtree (SL) Limited Company

Variables	OR	p - value	AOR	95% CI	p - value
Mill Department	0.71	0.1	3.31	2.96 - 4.07	0.04
Length of work between 3 - 5 years	0.45	0.01	2.22	1.64 - 7.04	0.03
Company's commitment on OHS	0.75	0.09	2.49	1.14 - 3.19	0.01
Excellent working logistics	0.51	0.02	3.13	1.99 - 4.66	0.01
Compliance with OHS measures	0.66	0.01	1.11	1.07- 3.54	0.03
Availability of OHS personnel	0.66	0.01	7.57	1.61 - 9.78	0.05

Workers who believed that the management of Goldtree (SL) Limited Company is being challenged to committing themselves in providing the appropriate personnel to handle OHS issues had high odds of experiencing workplace accident or injuries compared to workers who don't believe.

Distribution of workplace accident with length of service

There is a positive correlation between the number of workplace accidents or injuries among workers and the length of service of workers (Figure 5). Of the 39 (39%) of the workers who were interviewed that reported workplace accidents or injuries, majority (56.4%) have been working at Goldtree (SL) Limited Company for at least 2 years; 33% have been working for 3 – 5 years, 7.7% have been working for 6 – 8 years while 2.6% have been working for more than 8 years ($\chi^2 = 9.8778$, p-value = 0.02)

Figure 5: A graph showing length of service of respondents

Majority of the workers who experienced workplace accidents or injuries at Goldtree (SL) Limited Company during the study period had only spent at least two years at the job.

Discussion

OSH management is important in ensuring the health and safety of employees in the workplace. Failure to adhere to OSH practices can have serious consequences. We reported that 39% of the workers interviewed have experienced some form of a workplace accident or injury since their employment at Goldtree (SL) Limited Company. Majority (38.5%) of those who suffered from these accidents or injuries attributed it to the lack of adequate safety gears. Additionally, 92% of those who suffered a workplace accident or injury reported to the company. This is because failing to report a workplace accident or injury to the company's management will lead to the imposition of due penalties and sometimes can hinder the process of accessing medical service.

We were able to show a decreased odds of experiencing occupational accidents among workers who have spent between 3 - 5 years on the job, workers working in the mill department, workers who believed management is committed to addressing health and safety issues, workers who believed that their working tools were in excellent condition, as well as workers who agreed that they have rights and responsibilities for an effective workplace health and safety system compared to other workers who responded otherwise. However, there was an elevated odds of experiencing occupational accidents among workers who believed that management's commitment to provide the appropriate personnel to handle health and safety issues was a challenge. We also reported that the non-provision safety gears and equipment was the leading cause of workplace accidents or injuries at the company.

Conclusions

Our study was able to discover key issues relating to occupational accident especially in the agro-industry. We are recommending that employers's management should ensure the timely purchase and distribution of adequate safety gears and equipment to all workers as well enforce strict adherence and compliance for their use. We are also calling on management to organize regular OSH workshops, job training and seminars for their employees so as to provide them with regular updates on OSH issues.

Our findings underpinned the importance of conducting periodic monitoring and on-the-spot checks on companies to ascertain whether they are providing adequate safety gears and materials necessary for an effective workplace health and safety system.

Abbreviations

AOR = Adjusted Odds Ratio

ILO = International Labour Organisation

OSH = Occupational Safety and Health

SL = Sierra Leone

Declarations

Ethics approval and consent to participate

The Sierra Leone Ethics and Scientific Review Committee (Opinion date 29 March 2019) approved this study. All study participants read and approved the consent form prior to commencement of the survey in this study. Those study participants who were illiterate had the consent form explained to them in their own native language and their consent requested from them in the same language in accordance with the ethics committee requirements.

Availability of data and materials

The dataset generated and analyzed during this study are not public but can be accessed if sufficient request is made to the authors.

Competing interests

Although the first author (ETK) is an employee of Goldtree Ltd Company in Sierra Leone, all authors wish to declare that no competing interest is associated with this work in any form.

Funding

No part of this study received funding or compensation whatsoever during its conception, execution or for publication.

Authors' contribution

JBK, JLM and ETK conceived and designed this study as well as organized the conduct of this research in the research field. ETK, JBK, and AMG performed the statistical analysis. JBK and ETK drafted the manuscript. ETK, JBK, AMG, and JLM critically reviewed and revised the manuscript. ETK and AMG oversaw the collection and collating of the research data. JBK obtained ethical clearance. All authors have read and approved the manuscript for onward submission for publication.

Acknowledgements

Our sincere thanks to the health workers, military personnel attached to the 34 Military Hospital for collecting and collating the medical data that were analyzed in this study, as well as all those who suffered in diverse ways during the Ebola outbreak in Sierra Leone.

Authors' information

Not applicable.

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Figures

Figure 1

Map of Goldtree Limited Company, Sierra Leone concession areas

Figure 2

Distribution of workers of Goldtree (SL) Limited Company based on their marital status

Figure 3

Distribution of workers of Goldtree (SL) Limited Company based on their educational status

Figure 4

Distribution of workers of Goldtree (SL) Limited Company based on their length of service

Figure 5

A graph showing length of service of respondents