Personal Protective Equipment Evaluation of Workers of Dangote Cement Industry, Obajana Lokoja Local Government Area

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Abstract- ***The study evaluates the use of Personal Protective equipment among workers of Dangote cement industry, A case study at Obajana Area of Lokoja Local Government Area of Kogi state owing to the fact that an effective usage of Personal protective equipment can be very benefiting in preventing, controlling, and elongating the life of both employees and employers from any form of hazard that can arise within the working environment such as physical hazard, biological hazard, chemical hazard, and mechanical hazard, which can lead to loss of life or lead to deformity, the survey method of research was used for this study, this method involves the study of both large and small population by selecting and studying sample chosen from the population to discover the relative incidence, distribution and interrelation of variables, the researcher administered 100 questionnaires randomly to respondents while 90 were retrieved Upon the conclusion of the research, it would be seen that the requirement for Personal protective equipment is made adequate in Dangote cement industry within Obajana area of lokoja local government area. Workers across industries are exposed to a variety of hazards at the workplace. The use of Personal Protective Equipment (PPE) is an important strategy for preventing exposure to hazards that could result in injuries and illnesses among workers of Dangote cement industry. This particularly applies more to workers in work environment where it may not be practical to adopt other hazard mitigation strategies due to various constraints. Despite the widely acknowledged benefits of PPE use, studies have shown that PPE use remains low, inconsistent and inappropriate. Studies conducted have concentrated more on utilization levels of PPE rather than determinants of use. This study therefore ought to identify factors that influence use of PPE.***

Indexed Terms- ***Hazard, Safety, Workplace, Employer, Risk***

I. INTRODUCTION

Most people notably the working population spend a considerable amount of their time at work than they do at homes. Virtually all workplaces have recognizable hazards which people are exposed to (Montgomery, 1996). For this specific reason, the protection of workers against occupational related injuries and illnesses has been an issue of great concern to employers, workers, governments, and the public in general. This is because a safe working environment does not only promote the physical, mental and social well-being of workers, but also saves costs associated with medical expenses, work injury or loss of life compensation, work interruption, loss of experienced personnel and the resultant recruitment and training costs of new workers, and others resulting from accidents at the workplace. It is estimated that about 6,300 people die every day as a result of accidents at the places of work or occupational related diseases resulting in over 2.3 million deaths per annum (ILO

2010). This is on the background of over 337 million on-the-job accidents annually resulting from poor occupational safety and health practices (ILO 2001). Protection of workers from workplace hazards is crucial in reducing mortality and morbidity in the workplace. The use of Personal Protective Equipment is an important strategy to prevent occupational injuries and illnesses resulting from exposure to workplace hazards. Personal protective equipment, or "PPE" as is commonly referred, is any equipment worn by the worker or held to minimize exposure to serious workplace injuries and illnesses (Osha.gov, 2016). These injuries and illnesses may result from direct contact with chemicals, radiological, physical, electrical, mechanical, or other workplace hazards (Osha.gov, 2016). Personal Protective Equipment (PPE) are tools and accessories worn to guarantee users' safety and health protection. Typically, PPE is worn when there's a risk of exposure to health and safety hazards. Workers wear industrial PPE to protect themselves from physical, mechanical, electrical, and other workplace hazards in an industrial setting. Industrial PPE consists of any clothing or work accessories designed to protect against workplace hazards. Nonetheless, wearing the accessories does not eliminate the risks, and if the accessories fail, exposure will undoubtedly occur. (Dangote training manual on personal protective equipment). Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. (Dangote training manual on personal protective equipment). The employer is required to: Perform hazard assessment, provides appropriate PPE, Train employees, Maintain/replace PPE, Review/update/evaluate PPE Program. (Dangote training manual on personal protective equipment). Employers must protect employees from workplace hazards such as machines, hazardous substances, and dangerous work procedures that can cause injury. Employers must Use all feasible engineering and work practice controls to eliminate and reduce hazards. Then use appropriate personal protective equipment (PPE) if these controls do not eliminate the hazards. Remember, PPE is the last level of control! (Dangote training manual on personal protective equipment). The employee is required to Properly wear PPE, Attend PPE training, Care for, clean, and maintain PPE, Inform supervisor of needs for repair/replacement. (Dangote training manual on personal protective equipment). Type of PPEs include Head and neck protection, Eyes and face protection, Breathing protection, Hearing protection, Body protection, Hands and arm protection, Legs and feet protection (Dangote training manual on personal protective equipment). Head protection is needed when employees are exposed to hazards that have potential to cause a head injury. Impacts from: Falling or flying objects, Risk of bumping head, Hair entanglement. (Dangote training manual on personal protective equipment). Eye and face protection is needed when an employee work presents the potential of causing eye injury from physical, chemical, or radiation agents. Safety goggles, spectacles and full-face shields can give you the protection needed for the eyes and face. Damage from chemical splash, dust, light radiation and projectiles. Respiratory protections like respirators are designed to protect you from dust, fumes, paint spray, pesticides and other dangerous substances that could cause permanent impairment. Respiratory protection should be used in environments with dust. (Dangote training manual on personal protective equipment). Earplugs and earmuffs are common hearing protection tools. (Dangote training manual on personal protective equipment). Body protection is needed when work presents a potential for contamination or injury to other parts of the body such as legs, arms, back, chest. Exposure to extreme heat or cold, Chemical spillage or contamination on clothing Impact or penetration. (Dangote training manual on personal protective equipment). Hand and arm protection is needed when work presents the potential of causing hand injury from physical, chemical, or radiation agents because a lot of work is done with the hands, gloves are an essential item in providing skin protection. Some examples of gloves commonly used as PPE include rubber gloves, cut-resistant gloves, and heat- resistant gth air contaminants (Dangote training manual on personal protective equipment). Hearing protection It's recommended that worker exposures to noise be reduced to a level equivalent to 85 dBA for eight hours to reduce occupation hazard (Dangote training manual on personal protective equipment). Leg protection is needed when work presents hazards that have potential

to cause a foot injury; Wet conditions or slippery surfaces, Chemical splash, Falling objects Punctures. (Dangote training manual on personal protective equipment). PPE, protects its user against any physical harm or hazards that the workplace environment may present. It keeps you from being liable for your own injuries. Long-term conditions may result from a failure to protect yourself. It increases the quality of your workday. It's hard wearing It could save your life. (Dangote training manual on personal protective equipment). It offers direct protection from hazards such as: Noise induced hearing loss, rough handling, work Hazardous vapours, Sharp objects, ejected objects, splashes into eyes, Crush/impact the correct use of PPE will prevent you from incurring an injury. (Dangote training manual on personal protective equipment). PPE must be kept clean and sanitary. Clean PPE with mild soap and water. Some PPE may require special cleaning, in these cases use the manufacturer's recommendations. If PPE is contaminated and cannot be decontaminated safely, it may need disposed of in a special manner to protect other employees from exposure to the hazard. EHS shall be contacted. PPE shall be stored in such a way that it will not become contaminated such as plastic bags, lockers, closet, drawers. (Dangote training manual on personal protective equipment). Do not use PPE if it is damaged and in need of repair. It is the responsibility of the employee to make their supervisor aware as soon as PPE becomes damaged so that new PPE can be obtained. Do not attempt to repair PPE. (Dangote training manual on personal protective equipment). Also, PPEs is known as the last line of defense. the use of personal protective equipment has been identified as an important hazard control strategy in work environments where it may not be practical to adopt other strategies, and there is a great concern however that PPE usage remains low. Evidence indicated that workers use of PPE is influenced by various factors. It has been reported that the influencing factors include sociodemographic factors, perception about occupational disease, and expectations of the benefits and barriers of PPE use. (Dangote training manual on personal protective equipment). Research studies have shown that more than 90% of all occupational injuries are preventable through the adoption of safety measures as well as use of personal protective equipment (Nichol et al., 2008, Lipscomb, 2000). In addition, studies have determined that failure to use PPE was a primary contributor of exposure to hazards that could cause injuries and illnesses among workers in various occupations. Lack or improper use of PPEs by the workers lead to many occupational health issues and accident, which can lead to deformities, injury and even death of the employees. using of this PPEs properly reduce the risk and intensity of hazard on them. This background of study helps to access and evaluate the workers in obajana cement factory on their use of PPEs. Despite the availability of Personal Protective Equipment and its widely known protective value, the frequency of occupational injuries remains high throughout the developed as well as the developing world. Research studies carried out across the world show that workers use of PPE is low, not correct, and often incomplete and is not consistent. (Lombardi et., al, .2009, Z'gambo, 2015, Chepkener 2013, Muema, 2016). Therefore, both organizations and individual workers should strive to ensure workers safety though use of suitable PPE's when working, motivation and optimize knowledge related to work place risk management (Salman, 2009). OSHA contains provisions on quality and safety standards of any industry. Among these is the provision relating to use of personal protective equipment and appliances in situations where workers are exposed to hazards in the workplace. However, Occupational Safety and Health Administration (OSHA) has placed responsibilities of policy implementation on the employers and self-employed persons without providing proper monitoring mechanisms. Employers and self-employed persons henceforth can choose whether to use PPE or not hence weakening significance of the policies (OSHA, 2007).

The general objective of the study was to evaluate personal protective equipment of workers of Dangote cement industry Obajana Lokoja LGA, Kogi state.

Specific objectives

1. To determine the health implications of not using PPEs
2. To ascertain the employer enforcement strategies on the use of PPEs by the workers workplace
3. To make the workers understand that accident may occur while on duty and not using PPEs
4. To know the PPEs commonly use in their work place

5. To find out if there are/is agencies or enforcement bodies that inspect the use of PPEs in the workplace

Research Questions
1. Do you know that there is health implication of not using Personal Protective equipment?
2. Do employers enforce the use of Personal Protective equipment?
3. Do you know an accident can occur as a result of not using PPE?
4. Does your job prescription require the use of PPEs?
5. Which agency or organization visit often to access the use of PPEs

II. MATERIALS AND METHODS

3.1 Study design
The survey method of research was used for this study. This method involves the study of both large and small population by selecting and studying sample chosen from the population to discover the relative incidence, distribution and interrelation of variables. Therefore, personal observation, primary and non-primary materials, questionnaire were all used by the researcher so also some to gather all necessary information.

3.2 Study area
Dangote cement is a subsidiary of Dangote group of industries, which was founded by Aliko Dangote in 1981 as a trading business with an initial focus on importation of bagged cement and other commodities such as rice, sugar, flour, and salt. Over time, the group began to import bulk cement into Apapa and Port Harcourt terminals, which it then bagged for distribution. Nigeria is Dangote cement home market were manufacturing of cement started 2007. Dangote cement plants are located at OBAJANA, IBESE AND GBOKO.

Obajana, in Kogi state, is a flagship plant and the largest of the three factories in Nigeria at 16.25Mta capacity across five lines. Opened In 2008 with two lines totaling 5Mta it was the largest cement factory in sub-Saharan Africa. The cement plant extended capacity to 10.25Mta in 2012 with the opening of line 3; added a further 3.0Mta line in late 2014 and another 3.0Mta in 2020. Obajana has limestone reserves of 647 million tones, expected to last for about 45 years. The plant is supported by a fleet of 2,370 trucks. Obajana cement is divided into four section PLANT, MINES, AGRO SACK, AND TRANSPORT. My research was carried out Obajana cement plant. Which consist of various departments which includes, health safety and Environment, methods, production, process, mechanical, electrical, packing plant, cement mill, coal mill, loading crew, store, Admin,

3.3 Sample size and sample technique
The sample of the study is 100 people working in Dangote cement industry within the area of the study. The sampling technique used for this study is simple random sampling; it is easy to use because each element has equal and independent chance of being included in the research.

3.4 Instrument used for data collection.
Structural questionnaire is the instrument used for data collection. The questionnaire is designed in sections for respondents' bio-data and multiple questions on the research topic for the respondents to reply to provide the information required.

3.5 Validity of the instrument
All necessary observations and corrections by my supervisor in the research were noted to ensure that the instrument serves the purpose for which it was designed.

3.6 Reliability of the instrument
The instrument was administered among the target group in the study area using a test-retest method. The consistency in respondents replies ensures the reliability of the instrument.

3.7 Method of data collection
The researcher administered 100 questionnaires randomly to the respondents, and 90 was returned back. the questionnaire covered on evaluation of personal protective equipment on workers of Obajana in order to get reliable information.

3.6 Method of data analysis
The returned filled questionnaires from the respondents was arranged in percentage and presented in tabular form

By using this formula: $\frac{Number\ of\ responses \times 100}{Total\ number\ of\ respondents}$

3.7 Limitation of study.

- Time of leaving the house to join the company bus was not convinced
- My first day of carrying this research work in the company, a lot of people were absent due to public holiday
- Difficulty in collecting questionnaire been issued
- No enough books in the company library related to PPEs
- The time of this research study was short; in view of this I could not cover many areas for more facts.
- Some of the respondents were not faithful with their answers
- Present currency swap and hike in fuel affected the progress of this work

III. RESULTS

A total of 90 copies of questionnaires were distributed for the study

Each hypothesis was tested based on each question chosen from the questionnaire as regards the topic in question

Table 1: Distribution of age of the respondents

Age	Frequency	Percentage
20 -30	26	29%
31-45	40	44%
46 and above	24	27%
TOTAL	90	100%

The table above indicates that 26 respondents representing (29%) are between 20– 30 years, 40 respondents representing (44%) are between 31 – 45 years while the remaining 24 respondents representing (27%) are between 46 years and above.

Table 2: Occupational distribution of the respondents

Age	Frequency	Percentage
Skilled worker	56	62 %
Semi-skilled worker	22	24%
Unskilled worker	12	13%
TOTAL	90	99%

The table above indicates that 56 respondents representing (62%) are skilled worker, 22 respondents representing (24%) are semi skilled workers and the remaining 12 respondents representing (13%) are unskilled worker

Table 3: Educational background of the respondents

Educational Background	Frequency	Percentage
SSCE	20	22%
Graduate	42	52%
Post Graduate	23	26%
TOTAL	90	100&

The above table indicate that 20 respondents represent (22%) are SSCE, 47 respondents represent (52%),47 are Graduate representing (52%) and the remaining 23 respondents represent (26%) are post Graduate

Table 4: Are you aware that the use of personal protective equipment is mandatory?

Option	Frequency	Percentage
Yes	76	84%
No	14	16%
Total	90	100%

The above table 76 respondents represent (84%) are aware that use of personal protective equipment is mandatory,14 respondents represent (16%) are not aware that personal protective equipment is mandatory

Table 5: Is personal protective equipment provided by the employers?

Option	Frequency	Percentage
Yes	80	89%
No	10	11%
Total	90	100%

The above table indicate that 80 respondents represent (89%) said personal protective equipment is provided by the employers, 10 respondents represent (11%) said personal protective equipment is not provided by employers

Table 6: Are employees allowed to use personal protective equipment at will in their work place?

Option	Frequency	Percentage
Yes	27	30%
No	63	70%
Total	90	100%

The table above indicate that 27 respondents represent (30%) agreed that employees are allowed to use personal protective equipment at will in their work place, 63 respondents represent (70%) disagrees

Table 7: Isthere any penalty of not applying personal protective equipment in your work place?

Option	Frequency	Percentage
Yes	80	89%
No	10	11%
Total	90	100%

The table above indicate that 80 respondents represent (89%) stated that they are penalty for not applying personal protective equipment,10 respondents represent (11%) started that they are no penalty for not applying personal protective equipment in their work place.

Table 8: Are you aware that the use of personal protective equipment increases productivity?

Option	Frequency	Percentage
Yes	77	86%
No	13	14%
Total	90	100%

The table above indicate 77 respondents represent (86%) believes that personal protective equipment increases productivity, 13 respondents represent (14%) believes that personal protective equipment those not increase productivity

Table 9: Have you ever had an accident at work while working without personal protective equipment?

Option	Frequency	Percentage
Yes	27	30%
No	63	70%
Total	90	100%

The table above indicate 27 respondents represent (30%) Have had an accident while working without personal protective equipment while 63 respondents represent (70%) indicated that they have not had any injury while working without personal protective equipment

Table 10: Are there Agencies or law enforcement bodies that inspect and enforce the use of PPEs in your workplace?

Option	Frequency	Percentage
Yes	78	87%
No	12	13%
Total	90	100%

The table above indicate that 78 respondents represent (87%) stated that they are agencies or enforcement bodies that inspect and enforce the use of personal protective equipment in their work place, 12 respondents represent (13%) stated that they is no agencies or enforcement bodies that inspect and enforce the use of personal protective equipment in their work place.

Table 11: Are you aware of any relevant law that govern the use of PPEs?

Option	Frequency	Percentage
Yes	80	89%
No	10	11%
Option	90	100%

The table above indicate that 80 respondents represent (89%) are aware of relevant law that govern the use of personal protective equipment, 10 respondents represent (11%) are not aware of any relevant law that govern the use of personal protective equipment.

DISCUSSION

Proper use of personal protective equipment by the workers will reduce the risk of accidents impact and occupational health related issues. My research work makes the workers see reasons why it important to protect yourself from accidents using personal protective equipment, it also urge workers to work smarter not harder because their life is not just useful to them alone, but to them and their family. The table

(8) expressed that out of 90 respondents 77 agrees that use of personal protective equipment increases productivity.

CONCLUSION

Conclusively, an effective usage of Personal protective equipment can be very benefiting in preventing, controlling, and elongating the life of both employees and employers from any form of hazard that can arise within the working environment such as physical hazard, biological hazard, chemical hazard, and mechanical hazard, which can lead to loss of life or lead to deformity. Your life is important because you can get another job but not another life, when you die the company can replace you immediately, so whatever we do we should consider our safety first, don't be in a hurry to do things without your personal protective equipment. One of the reasons of engaging in an Occupation is to earn a living not to end a living.

RECOMMENDATION

From the foregoing account, it would be seen that the requirement for Personal protective equipment is made quite adequate in Dangote cement industry Obajana, Lokoja Local government area Kogi state; but some of the workers intentionally refuse to use them.

- The management should try and continue training and retraining their staff at least four times in a year by employing a professional on each aspect of the training to be covered.
- Proper medical examination should be conducted on the employees before being allocated to their various posting areas within the working environment, this should be done before employment and at interval, to promote and maintain the health of the workers.
- More health workers such as Environmental health officers and safety officers should be employed within the working environment so as to be health educating and enlightening the workers on the use of protective wears.
- There should be provision for good working experience by adopting adequate information, communication and technology strategies.
- Adequate measures to discipline and implementation of sanctions should be adopted by the employers to the violators (employees).
- The safety and health processes and performance of the organization should be compared with others to improve health and safety performance at work place.
- The management of each and every working environment should try as much as possible to provide their employees with personal protection equipment such as helmet, rain boot, and uniform, hand gloves etc.
- There should be provision for punishing in order to enhance the utilization of personal protective devices/equipment in such industry.

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