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RESEARCH ARTICLE OPEN ACCESS

The impact of health and safety programs on employees' productivity. A case study of Anglo Gold Ashanti (Obuasi branch).

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ABSTRACT
Accident rates in the mining industry have dropped in many countries as a result of an occupational safety and health culture that encourages employee health and well-being. Due to illegal mining, the use of poor technological equipment, and inadequate occupational safety and health precautions, the majority of mining-related fatalities now occur in rural areas of Ghana. In Ghana, mining has one of the two or three highest rates of work-related diseases and injuries that result in death.
Through a case study of AngloGold Ashanti, the study aims to investigate the influence of occupational safety and health on employee productivity in the mining sector (Obuasi branch). Using a quantitative method, the respondents' responses are numerically quantified. The study collected data from 365 staff at AngloGold Ashanti's Obuasi branch using a simple random sample procedure. The data was analysed using Stata software and displayed using multiple linear regression.
According to the study findings, a health and safety management system, illness and injury investigations, task analysis, and training and orientation have a positive and statistically significant effect on employee productivity, whereas personal protective equipment has a positive but not statistically significant effect on employee productivity. We also found that inspection/job observations, communication/promotion of safety and health, and communication/promotion of safety and health have a negative and statistically significant effect on employee productivity.
The study would assist management and leadership in strengthening their health and safety systems to ensure the safety of their workers at all times. The government should also use the study's results to help set up complicated health and safety programs for illegal miners to reduce the number of deaths in Ghana's rural areas that are caused by mining.
Keywords: Ghana, health and safety, mining, occupation, hazard, productivity, and safety.

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I. Introduction

Alsamawi et al. (2017) highlighted that the study of worker injuries and illnesses around the world is what is a term as global occupational safety and health. Global occupational safety and health study focuses on international employees' well-being. It also looks at the reasons for regional and national variances in the rates of occupational sickness and death, as well as what may be done to improve working conditions worldwide (Eikemo et al., 2008). Occupational safety and health refer to the practise of ensuring the health and safety of workers as well as the workplace's equipment and environment. According to Kumie et al. (2016), the primary goal of occupational health is to protect workers from developing diseases and suffering accidents that are the direct result of dangerous conditions that exist in the workplace. It focuses on improving the workplace and ensuring the well-being of employees. In terms of occupational health, an employee's ability to function at an optimal level in the workplace may be measured in a number of ways, including worker productivity, work attendance, the number of claims for disability compensation, and length of employment (Harrison & Dawson, 2016).

An occupational health and safety program are intended to detect potential workplace hazards

and implement Preventive measures (Saravanabavan and RamathNisha,2020). These hazards can take the form of chemical agents and solvents, heavy metals such as lead and mercury, physical agents such as loud sounds or vibrations, and physical threats such as electricity or hazardous equipment (Jerie, 2016). There are also other things that occupational health deals with, such as preventing and treating illnesses and injuries caused by hazardous workplace exposures (Friis, 2014). According to Hollnagel (2018), the condition of being safe is the state of not being in any danger, suffering any injury, or suffering any loss. Occupational safety in the workplace is concerned with ensuring the well-being and protection of workers. A workplace is considered risk-free if there are no potential dangers that might lead to accidents or illnesses that are caused by the work environment (Makin & Winder, 2008). Increasing workplace safety can be accomplished in part by developing and adhering to a set of rules. The process of improving occupational safety has many different components, some of which include the following: continuous monitoring of occupational hazards; identification of hazards; information exchange regarding risks; and collaboration between employers and employees (Hofmann, Burke & Zohar, 2017).

According to Nowrouzi-Kia et al. (2018), mining remains one of the world's most dangerous occupations, despite major efforts in many nations to implement and maintain occupational safety and health regulations.Mining employees throughout the globe continue to suffer from a high mortality, injury, and illness rate (Marks, 2006). In terms of health and safety, there is still a significant amount of work that has to be done, and it will take some time to get there. Over and beyond workplace accidents, the absorption of airborne contaminants is a major contributor to many of the negative health impacts connected with mining and extractive industries (Mishra, 2018). As a result, mining can be dangerous because of things like poisonous chemicals, noise and vibration, heat, and cold stress, as well as shift work. According to Burström et al. (2017), self-employed miners often labour in unsupported tunnels, drilling and extracting rock using hand tools and hauling ore up to the surface in bags. These include falls, being struck by equipment or a moving item, and cave-ins or rockfalls (Leung & Lu, 2016). In 2002, the World Health Organization said that the biggest threats to health come from dust and other toxins, as well as noise and vibration, heat and humidity, oxygen depletion, overexertion, and other things that make people sick.

Accident rates in the mining industry have decreased in many nations due to an occupational safety and health culture that promotes the health and well-being of employees. The majority of mining-related fatalities now occur in rural areas of Ghana due to illegal mining, the use of substandard sophisticated equipment, and inadequate occupational safety and health precautions (Ayelazuno&Mawuko-Yevugah, 2019). There has been a decrease in the frequency of deaths and accidents in formal mining as a result of enhanced safety measures. However, mining remains one of the primary causes of death in several Ghanaian formal industries. Mining has one of the two or three highest rates of work-related illnesses and injuries that lead to death in Ghana (Nakua et al., 2019). There are no national records for illnesses and injuries in the informal mining industry in Ghana. Working conditions in illegal mining are frequently seen as harsher than those found within legitimate mines. Machine accidents, inadequate lighting and ventilation, electrocution, and explosive abuse are also common problems in informal mining (Beth 2018). There are a lot of accidents at work in informal mining because of ground failures and pit collapses.

Reese (2017) outlined that health and safety programs should contain an element of a health and safety management system, inspection and job observations, illness and injury investigations, task analysis, training and orientation, personal protection equipment, communication and promotion of safety and health, and off-the-job safety and health. The purpose of the study is to determine how the elements of health and safety outlined by Reese (2017) impact employees' productivity in Ghana with reference to AngloGold Ashanti. The following researchers (Amponsah-Tewiyah and Dartey-Baba, 2011; Puplampu& Quartey, 2012; Amponsah-Tawiah, 2013; Asumeng et al., 2015; Stemn, 2019) conducted a study on health and safety in Ghana. None of the research focused on how worker productivity is affected by factors such as workplace safety and health. Moreover, the influence of occupational safety and health on employee productivity has not been examined in Ghana, or it has been underexplored in Ghana; this creates a knowledge gap in the existing body of research. As a result, the research will concentrate on the influence that safety and health programs on employee productivity in the mining industry.

II. Literature review

Occupational Health and Safety

According to Che Huei et al. (2020), occupational health and safety is a public health component that attempts to promote workplace health and safety. In addition to research on worker

health and safety, there are recommendations for reducing workplace hazards and risks. Every boss is responsible for making sure that their workers can do their jobs as safely as possible. OHS is a discipline of public health dedicated to raising the bar for workplace health and safety (Battaglia, Passetti & Frey, 2015). Employers may learn about the most common injuries and illnesses among their employees, and then take those findings and use them to improve workplace safety for everybody. An occupational hazard may be characterized as a potential threat to an employee's health or well-being as well as a prospective influence on the surrounding community and the broader environment (Amfo-Otu& Agyemang, 2017). Occupational safety and health regulations must provide long-term favourable working conditions and a strong emphasis on prevention. Preventing workplace accidents, injuries, and exposure to hazardous substances is the primary goal of occupational health and safety (OHS).

Health and safety programs

Friend and Kohn (2018) say that safety programs are written action plans for recognising and dealing with threats, defining safety obligations, and responding to crises, all with the goal of reducing accidents and occupational diseases. Every facet of a company's operations must take workplace safety and health into account. When safety and health measures are in place, the incidence of workplace injuries, illnesses, and deaths drops, which benefits everyone: workers, their families, and employers (Jilcha&Kitaw, 2017). The health and safety programs are managed by proactive and traditional techniques. Maintaining a healthy and safe workplace is an important part of taking a proactive approach.

Darshana (2017) states that the goal of health and safety programs is to keep employees safe, decrease dangers, and maintain a healthy and safe workplace. Every business must have a health and safety programme in place at the location of the business they operate. The number of employees and the level of danger they face should inform the sort of program that is required (Lingard, 2002). Having a safe work environment where prevention is a priority to an organization's performance is crucial to all workplace parties. It is possible for a company to save money and save lives by implementing safe working practices

The components of health and safety programs
Health and safety management system

According to Filimonov&Gorina (2019), a workplace safety and health management system is a set of connected or interacting components that are used to define and achieve the objectives of occupational safety and health (OSH). Preventing workplace injuries and illnesses through a proactive, team-based approach to safety and health management is the goal of this method. In addition to protecting your employees and saving money, implementing a safety and health management system will also improve the performance of all of your hazard-specific programmes (Tamers et al., 2020). Organizational Health and Safety (OHS) management systems are more than just health and safety programs.

When an organization has a good management system in place, they are better able to recognize and handle workplace risks and hazards on a constant basis (Sturdy, 2010). Safety programs help organizations understand their commitments to their workers under OSHA laws and how to satisfy those obligations. Managers and officers in charge of safety programs work for organisations to ensure that safety standards are followed and that they are enforced. They are responsible for making sure that these things happen (Peltier, 2016).

H0: The health and safety management systems have no influence on an employee's productivity.

H1: The health and safety management systems have an influence on employeeproductivity.

Inspection and job observations

According to Vinodkumar&Bhasi (2010), frequent workplace inspections are aimed at discovering harmful circumstances before they lead to an incident. However, when an incident happens, it is necessary to examine it to avoid future mishaps. A thorough investigation should be conducted whenever an accident occurs at work, so that the root cause may be discovered. If the underlying causes and root causes can be found, the health and safety representative will be able to make specific suggestions for future prevention (Kletz, 2007).According to Otaibi Divine & Qahtani (2017), health, safety, and environmental observation and workplace inspections are vital for the security of a company. To maintain the safety of the firm and improve its level of security, this should be done on a consistent basis. Health, safety, and environmental inspections are conducted to assess whether or not activities are being carried out in line with the processes established to accomplish the task in a safe and effective manner (Lerman et al., 2012). The purpose of the observations is to make individuals aware of their conduct by getting into discussion with them. It should be a discussion, not a monologue, or else people will feel patronized or the reverse will be attained

Organizations conducting health, safety, and environmental observations should create a

checklist to help them keep track of everything they need to pay attention to (Kaila, 2011). An organization may add to this checklist of health, safety, and environmental observations if new circumstances or concerns arise throughout the observation. A checklist must be created to assist the management, not to serve as a guideline. Managers must constantly go beyond the checklist when making decisions. According to Zhang Boukamp &Teizer (2015), routine site safety and health inspections are intended to detect dangers that may have been overlooked at a previous stage.

H0: Inspection and job observations have no influence on an employee's productivity.

H1: Inspection and job observations have an influence on employee productivity.

Illness and injury investigations

Investigations into disease and injury trends throughout time are critical for spotting patterns. It is possible to avoid future events by identifying dangers, controlling them, and identifying common causes of injuries, illnesses, and near-misses. Every work-related sickness or injury must be thoroughly evaluated in order for management to come up with recommendations on how to avoid a recurrence of such a problem (Shamsuddin et al., 2015). Most injuries and diseases are avoidable. The objective of the inquiry is not to assign blame, but to discover contributory elements that may subsequently be managed. Similar occurrences may be prevented in the future by understanding the causes that contributed to the incident and then modifying the circumstances or behaviours.The Workplace Injury and Illness Trend Analysis Program tracks work-related injuries and illnesses to reveal unhealthy behaviours or harmful conditions. There are occupational health and safety education activities in place to help avoid or reduce workplace accidents and illnesses.

To make sure that the safety program is working properly, organizations need to look at the data for quality assurance and keep an eye on the safety program's leading and trailing indicators to find possible solutions and make changes so that they do not have any more workplace accidents or illnesses (Rout &Sikdar, 2017).

H0: Illness and injury investigations have no influence on an employee's productivity.

H1: Illness and injury investigations have an influence on employee productivity.

Task analysis

A task analysis is a method that seeks to combine health and safety concepts with particular activities or operations. The task or work is assessed by identifying each stage in the process and analysing the inherent risks and hazards associated with each phase (Kirwan, 2017). The safest approach to completing the work may then be determined and put into action. An effective task analysis, according to Shepherd (2003), helps to increase production by making certain that relevant people, equipment, and procedures are on hand when needed. Task analysis should detail how you intend to execute the work safely and demonstrate that you are controlling risk. In doing a task analysis, OSHA advises that the workers who participate in the job being evaluated be included. Professionals in the fields of health and safety should begin prioritizing job analysis based on the degree of danger that each activity poses to employees' health (Badri, Nadeau &Gbodossou, 2012). According to Williams & Roberts (2018), it is necessary to regularly examine the work space to keep dangers under control and keep employees safe. Some of the ways to do task analysis include: inspecting and maintaining the equipment thoroughly and on a regular basis, ensuring that all hazard identification and correction procedures are in place, and ensuring that everyone knows how to use PPE.

H0: Task analysis has no influence on an employee's productivity.

H1: Task analysis has an influence on employee productivity.

Training and orientation

Safe work practices are a fantastic tool as long as they are really put to use and not neglected. All personnel must be acquainted with the processes so they may conduct their tasks as safely as possible. Providing workers with the necessary training and orientation is a vital component of any health and safety program (Salas et al., 2012).To ensure that everyone in the workplace takes their health and safety responsibilities seriously, a program that includes regular training and orientation of personnel is essential.Safety and health training are crucial to any work environment. Training comprises hands-on, job-specific education offered individually or in small groups to workers. Supervisors can make sure that workers understand safe work practices by watching demonstrations and actively participating in them (Nassazi, 2013).

The company's entire training program on performance standards and work practices is most successful when it incorporates safety and health training (Sorensen et al., 2018). Workplace accidents may be prevented by providing employees with adequate training, which lowers insurance rates and decreases the risk of legal action. It would also help to create a more positive work environment for everyone (O'Toole, 2002).

H0: Training and orientation has no influence on an employee's productivity.
H1Training and orientation has an influence on employee productivity.

Personal protection equipment

Wearing PPE, or personal protective equipment, reduces the risk of major occupational accidents and illnesses by protecting workers from potentially harmful substances (Sehsah, El-Gilany& Ibrahim, 2020). In the event that engineering and administrative procedures are not feasible or successful in protecting employees from hazardous circumstances, personal protective equipment (PPE) is used. This includes gloves, hard helmets, face mask, and respirators (Sarkar et al., 2020). When there is danger, personal protective equipment (PPE) is needed. As a consequence of this major constraint, PPE may result in personnel being exposed to hazardous conditions even when the equipment is working properly (Chinniah, 2015).

Ergonomic design and the right application of personal protective equipment (PPE) can significantly reduce these dangers (Eaves, Gyi & Gibb, 2016).According to Sethi & Ramesh (2020), safe and reliable personal protective equipment should be created and manufactured. It should be comfortable to wear, which makes it more likely that the user will put it to good use

H0: Personal protection equipment has no influence on an employee's productivity.
H1Personal protection equipment has an influence on employee productivity.

Communication and promotion of safety and health

According to Hongoro& McPake (2004), communication is crucial to a safe, healthy, and productive workplace. Roles and responsibilities must be clearly defined; risks must be needed, and dangerous activities must be avoided; emergency response must be promoted; and the problems and hazards that employees face must be uncovered. It could also help employees become more aware of health and safety issues at work, learn more about ways to promote health at work, and improve their health over time (Grawitch, Gottschalk, and Munz, 2006).

Nosbusch, Weiss, and Bombay (2011) say that good communication can help employees learn more about a health problem or solution and understand it better. Both the program's marketing strategy and the rationale for its strategic direction must be included in the messages, said Kolbe-Alexander et al. (2012). It is impossible to have a successful health promotion program if workers do not know about the options that are accessible to them. Its critical that employees understand the goals of the program in terms of their own well-being as well as the overall health of the business.
H0: Communication and promotion of safety and health have no influence on an employee's productivity.
H1: Communication and promotion of safety and health have an influence on employee productivity.

Off -the-job safety and health

There are fewer workplace accidents and injuries when safety is integrated into a company's value system, worksite culture, and the way of life of its employees (Hongoro& McPake (2004). A company's safety culture may be extended to off-site events, or issues of off-site safety might be included in a company wellness program. Both approaches promote a culture of total worker health and may result in a more secure and healthier workplace for all employees involved in the process.

According to Hymel et al. (2011), an excellent method for businesses to show that they truly care about their employees and the families of their employees while those employees are not at work is for the firm to sponsor community events. As a result, employees' trust and participation in other workplace health and wellness initiatives may be bolstered as a result. Production, work quality, job expenses, and employee morale may all be negatively impacted by an accident or sickness. Every time an employee, particularly an experienced one, is absent from the workplace for an unplanned amount of time, productivity, and efficiency suffer. There is always a supervisor or worker shortage until the employee returns, is replaced, or someone steps in to fill in the void (Katsuro et al., 2010).
H0: Off-the-job safety and health have no influence on an employee's productivity.
H1: Off-the-job safety and health have an influence on employee productivity.

Employees' Productivity

An employee's productivity is measured by their productivity, which is also known as productivity at work or workplace productivity. Worker productivity is not to be confused with overall economic production per labour hour (workforce productivity), which is the total economic output of a nation or firm (Blinder, 2011). A worker's or group's productivity is measured by looking at how effective they are at what they do. An employee's production during a certain period may be used to gauge their productivity. A worker's productivity is often measured in comparison to the average of all workers performing the same kind of job. Companies place a high value on employee output because it is critical to their long-term success.

Organizations must enable their employees to develop their humanity and their ability to perform at their best if they want to increase their productivity. Having a high level of staff productivity has a number of advantages that indicate its value to your firm. An increase in profitability and growth are necessary for the company. It must also match customer demand and be competitive. This increases the company's profits and, in turn, helps the growth of the company.

III. Methodology

Research design

According to Tunarosa (2017), research design is the method by which you bring together all components of your study in a logical and cohesive manner so that you can be certain that you will be able to address the research topic. Data collection, measurement, and analysis are all outlined in this guide. The study used a descriptive research design. What, when, where, and how are all questions that may be answered by descriptive research, but a descriptive study cannot address why. Descriptive research is used to get information about how things are now and to describe what is going on with variables or conditions in a situation (Blumberg, Cooper & Schindler, 2014).

Research instruments

According to Yilmaz (2013), an analytical research instrument is a tool used to collect, measure, and assess data relevant to your topic. Tests, polls, scales, questionnaires, and even checklists can serve as research instruments. The research tool employed for the study was the questionnaire. The rationale for the use of the questionnaire is that it makes it feasible to contact many individuals who could not otherwise be contacted. It may cover a huge group at the same time. Researchers can reach a group of people who are spread out across a wide area, and the use of a questionnaire helps to cut costs. The questionnaire consisted of three sections. Section A solicited personal information from the respondents. Section B collected data on the various components of health and safety programs implemented in the organization, and Section C gathered information on the employee's productivity.

Validity and reliability

The validity and reliability of the research instruments are examined. Testing an instrument's validity ensures it can be used for the study at hand, while reliability checks to see if it consistently produces the same results when used to measure the same thing multiple times. As a result, the validity of the instruments was investigated to ensure that they were internal and consistent. The validity tests were carried out using Kaiser-Meyer-Olkin (KMO) and Bartlett's Test. If Kaiser-Meyer-Olkin is greater than 0.50 and Bartlett's Test is statistically significant, it means that the instruments are valid.

The reliability of a questionnaire is determined by subjecting it to a reliability test; a measuring instrument is reliable if it consistently produces similar outcomes. Statistical analysis, namely, the Cronbach alpha coefficient, can be used to determine whether the instrument being used can be trusted or not. If an instrument's Cronbach's alpha is greater than 0.70, this shows that it is reliable.

Population

A study population may alternatively be characterized as a well-defined collection of individuals or products that are known to have similar characteristics. In general, all members of a certain group have a single unifying characteristic or attribute (Mõttus et al., 2020). The population for the study was employees of AngloGold Ashanti, Ghana Branch. AngloGold Ashanti has 4210 employees working in all their various departments.

Simple size

The term sample size refers to the total number of participants or observations that are used in a study. To arrive at the sample size, the study used Yamane formulae.

$n= P/ (1+P(e)^2)$

The sample size is presented by "n"
The population is presented by "P"
The margin error is presented by "e"
Y = 4210
s = 0.05
"n" = 4210/1 + 4210 (0.05) 2
"n" = 4210/11.53
"n" = 365.

Sampling method and data collection procedures

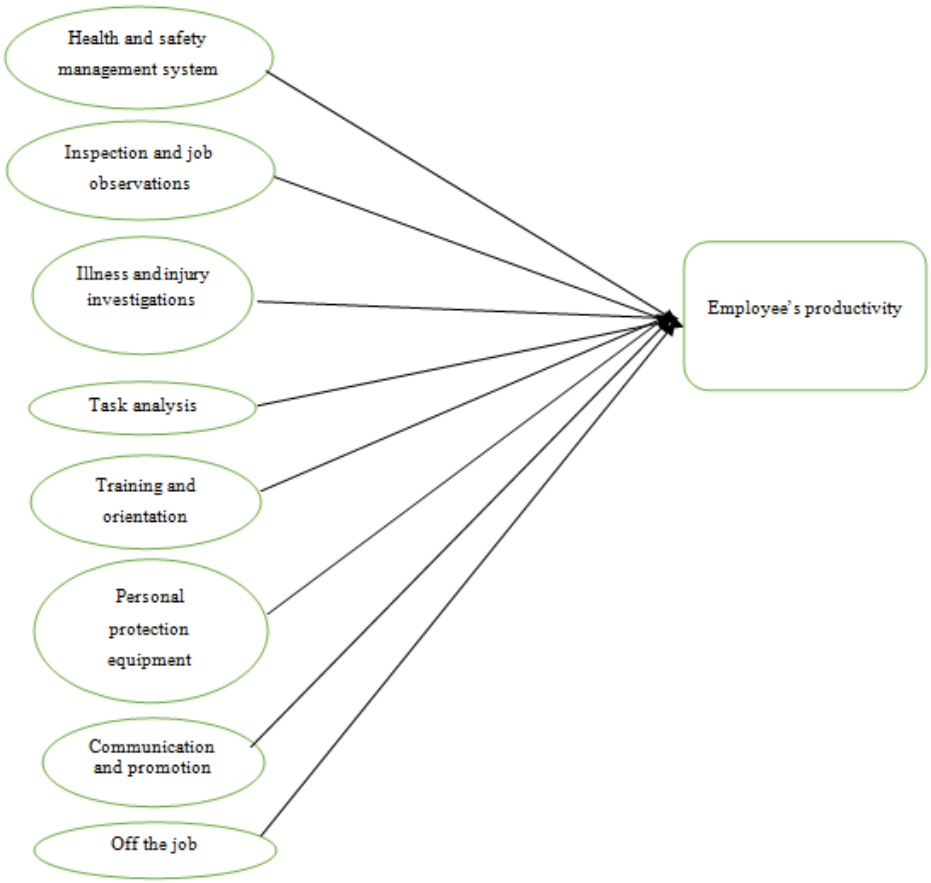
A research population is any number of people or things that are the subject of a scientific investigation. Attempting to analyze every individual in a population would be prohibitively expensive and time-consuming for the researcher. This is the reason researchers depend on sample approaches. The sampling method used for the study was the unrestricted simple random sampling method. A sample taken at random from a larger population is known as a random sample. This sampling technique has a one-in-one chance of selecting everyone in the population. As the name suggests, this is the simplest technique of probability sampling, requiring only a single random pick and no prior knowledge of the population. Any

research conducted by this group is likely to be extremely reliable, both internally and externally.

The questionnaire was administered to the AngloGold Ashanti workers during their normal working hours.

Conceptual framework

The conceptual framework is often constructed based on a literature assessment of current research and ideas regarding the issue. The model used for the study was used by Reese (2017). The components of the health program are independent variables and the employee's productivity is the dependent variable.



Source: Reese (2017)

Model specification

To find the effect of health and safety programs on employees' productivity, the linear multiple regression model was used. The model is specified below;

$$EMPDT = \beta 0 + \beta 1HSMS + \beta 2IJOS + \beta 3IJIG + \beta 4TSKAN + \beta 5TROT + \beta 6PPE + \beta 7CPSH + \beta 8OJSH + \varepsilon$$

Where EMPDT represented the employee's productivity, HSMS represented the health and safety management system, IJOS stood for Inspections and Job Observations; IJIG stood for Illness and Injury Investigations; TSKAN stood for task analysis; TROT stood for training and orientation; PPE stood for Personal Protection Equipment; CPSH stood for communication/promotion of safety and health; OJSH stood for off-the-job safety and health; and ε represented the error term.

Data analysis

All data collected was coded using Microsoft Excel. The scientific software that was used to analyze all data was Stata, which enabled the researcher to achieve the objectives of the study. The data was presented in tables. Inferential and descriptive statistics were performed. The descriptive statistics show the mean, standard deviation, minimum and maximum. The inferential statistics include regression, correlation, and various diagnostic tests performed.

IV. Results and discussions

The results show that 37 workers are between the ages of 18 and 20, accounting for 10.14%; 94 are between the ages of 21 and 30, accounting for 25.75%; 130 are between the ages of 31 and 40, accounting for 35.62%; 73 are between the ages of 41 and 50, accounting for 20%; and 31 are between the ages of 51 and 60, accounting for 8.49%. There were 365 total respondents, with 233 males representing 63.84% and 132 females representing 36.16%. Out of the total 365 respondents, 14 are secondary school leavers, accounting for 3.84%; 86 are diploma holders, accounting for 23.56%; 163 are degree holders, accounting for 44.66%; 89 are masters' holders, accounting for 24.38%; and 13 chose others, accounting for 3.56%.
The results show that 46 are from the engineering department, accounting for 12.60% of the total sample size of 365; 44 are from the construction department, accounting for 12.05%; 71 are from the exploration department, accounting for 19.45%; 54 are from the operation department, accounting for 14.79%; 43 are from the metallurgist department, accounting for 11.78%; 42 are from the human resource department, accounting for 11.51%; and 18 are from the marketing department. 47 people have worked in the organisation for less than 5 years, accounting for 12.88% of the total sample size of 365; 64 people have worked in the organisation for 5-10 years, accounting for 17.53%; 146 people have worked in the organisation for 11-15 years, accounting for 40%; 90 people have worked in the organisation for 16-20 years, accounting for 24.66%; and 18 people have worked in the organisation for more than 20 years, accounting for 4.93%.

Table II shows the relationship between employees' productivity, health and safety management system, inspection and job observation, illness and injury investigations, task analysis, and training. Personal Protection Equipment, Communication, Off-the-Job Safety and Health, and health and safety programs. Employees' productivity has a positive relationship with health and safety management systems, illness and injury investigations, task analysis and training, Personal Protection Equipment, communication and health and health and safety programs, while it has a negative relationship with inspections/Job Observation and Off-the-Job Safety and health.

Table III shows the results for the validity tests. The results for KMO were greater than 0.70 (Zhang, 2012) showing that the instruments (questionnaire) used are valid and the results for Bartlett's test were statistically significant.

Table IV shows the results of the reliability test carried out to test if the research instruments are consistent or not. According to Hadadi et al. (2017), if the coefficient of Cronbach's Alpha is greater than 0.70, then the instruments are reliable. The coefficients obtained for all eight instruments used are greater than 0.70. Therefore, the instruments are considered reliable.

Table V shows the results of the multiple linear regression model. The results show that health and safety management systems have a positive effect on employees' productivity. If the health and safety management system of the organization were improved by 1%, there would be an increase in employees' productivity of 0.175%. The health and safety management system are statistically significant at 10%, and it has an influence on employees' productivity. Therefore, the hull hypothesis is rejected and the alternative hypothesis is accepted. Morgan et al. (2021) found that health and safety policy management and staff productivity have a strong positive mediating influence on the connection between work satisfaction and job satisfaction, and the findings are supported by the study results obtained. Kaynak et al. (2016) found that safety processes and risk management, safety and health standards, and organisational safety support all affect how well workers do their jobs, which is in line with the study's results.

Inspections and job observations have a negative effect on employee productivity. If the inspections and job observations are improved by 1%, the employees' productivity will fall by 0.132%. Inspection or job observation is statistically significant at 10% and has an influence on employee productivity in the organization. Therefore, the alternative hypothesis is accepted, and the study concludes that inspection/job observation influences an employee's productivity.

Illness and injury investigations have a positive effect on an employee's productivity. If the organization's illness and injury investigation was improved by 1%, it would lead to an increase in employee productivity of 0.14%. The results show that illness and injury investigations in the organisation have an influence on employees' productivity since it is statistically significant at a 10% level. Therefore, the alternative hypothesis is accepted.

The results from the regression model show that task analysis has a positive effect on an employee's productivity. If the task analysis of the organization was improved by 1%, it would lead to an increase in employee productivity of 0.481%. The results also show that task analysis in the organization has an influence on employees'

productivity. This is because the hull hypothesis is accepted and the task analysis is statistically significant at a 10% level.

The results show that training at the organization has a positive effect on employees' productivity. If worker training is improved by 1%, it boosts productivity by 0.235% and is statistically significant at the 10% level. Training has an influence on an employee's productivity; therefore, the alternative hypothesis is accepted. Al Karim (2019) concluded that training has a positive impact on productivity and the findings by Al Karim (2019) support the study results. Adim&Mezeh (2020) concluded that employees perform better when they are trained and the findings are precise as what was discovered from the study results. Nwachukwu, Akpuh, and Chiomab (2020) came to the conclusion that health and safety policies, especially training, have a big effect on how well employees do their jobs, and these findings are in line with what was discovered from the study objectives.

The results from the linear regression table indicate that personal protection equipment has a positive effect on employees' productivity. If personal protection equipment is increased in the workplace by 1%, it will contribute to an increase in employees' productivity by 0.059%. The impact has no large effect on the employee's productivity. However, despite personal protection equipment having a positive effect on employees' productivity, it is not statistically significant. It has no influence on an employee's productivity. Therefore, the hull hypothesis fails to be rejected. The study by Katsuro et al. (2010) found that OHS could be better in the food business if businesses started training programs and used new equipment, and the findings are backed by the study results. Shikdar&Sawaqed (2003) concluded that an organization may suffer from inadequate ergonomic conditions due to a lack of expertise in ergonomics and training, as well as communications and resources, and the findings are in line with the results of the study.

The results show that communication has a negative effect on employee productivity. If the communication or promotion of health and safety is improved by 1%, employees' productivity will fall by 0.119%. The finding shows that communication has an influence on an employee's productivity since it is statistically significant at 1% level. Therefore, the alternative hypothesis is accepted.

The results show that off-the-job safety and health have a negative effect on employees' productivity. If off-the-job safety and health are improved by 1% in the organization, it will contribute to a reduction in employees' productivity by 0.09%. Off -the-job safety and health have a small impact on an employee's productivity. The results show that it has no influence on an employee's productivity since it is not statistically significant. Therefore, the hull hypothesis fails to be rejected.

The results show that the model is fit for the study and the results are reliable since the probability value is less than 5%. Moreover, the independent variables (health and safety management system, Inspection/Job Observation, illness and injury Investigations, Task Analysis, Training, Personal Protection Equipment, Communication/Promotion of Safety and Health, and Off-the-Job Safety and Health) have a joint effect on an employee's productivity since the F-test is greater than 5%. Again, the results show that the independent variables explain the variation in employees' productivity by 49.6%.

V. Conclusions and implications to managers

The purpose of the study was to determine how health and safety programs influence employee productivity at AngloGold Ashanti. The study used a simple random sampling method to collect data from 365 workers at AngloGold, Ashanti, and the responses were analysed using Stata software. The results were presented using multiple regression.The study found that employees' productivity has a positive relationship with health and safety management systems, illness and injury investigations, task analysis, training, personal protection, equipment, communication, and health and safety programs. Employees' productivity has a negative relationship with inspection/job observation and off-the-job safety and health.

It was also discovered that health and safety management systems, illness and injury investigations, task analysis, training and orientation, and personal protection equipment have a positive effect on employees' productivity. Except for personal protection equipment, all of these variables were found to have a statistically significant effect on how productive employees were.Inspections and job observation, communication and promotion of safety and health, and off-the-job safety have a negative effect on employee productivity. Except for off-the-job safety, all variables were found to have a statistically significant effect on worker productivity.

The health and safety management system, inspections and job observation, illness and injury investigations, task analysis, training, personal protective equipment, communication and promotion of safety and health, and off-the-job safety and health all have a joint effect on an employee's productivity. Health and safety have an

impact on employee productivity. Therefore, managers are encouraged to ensure the health and safety of their employees in the mining sector. The failure to provide workers with the requisite health and safety training can cause injury to them while on post and the organization may suffer a lot of cost which is connected to their medical and others. They can also suffer from a lawsuit, and they would end up paying more than the money that they could have used to prevent it.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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