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# Occupational Hazards and Safety: How Knowledgeable are Quarry Workers on Accident Prevention at Work in Nigeria?

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***ABSTRACT***

**Background**: The increased number of quarry activities in Ogu State Nigeria without the commensurate provision of safety resources is an issue of great concern to public health. This study examines the occupational health and safety risks related to quarrying activities among workers.

**Methods**: A cross-sectional survey research design was used, The instrument for data collection was a structured questionnaire developed by the researchers which were: The Knowledge of Occupational Safety and Health-Hazards Questionnaire (KOSHQ) (r = 0.75) and Relationship between Occupational Hazards and Psychological Well-Being Questionnaire (ROHPWQ) (r = 0.84). Descriptive statistics of percentage/frequency were used to describe the demographic characteristics of the participants while Pearson Product Moment correlation was used to test the hypotheses

**Results**: The findings of the study showed that there was a strong, positive, and significant relationship between knowledge of occupational safety, health hazards, and the health of quarry workers (r = 0.940, p-value < 0.05); also, there was a very strong, positive, and significant relationship between occupational hazards and psychological well-being of quarry workers (r = 0.911, p-value < 0.05). a very strong, positive, and significant relationship was observed between knowledge of occupational safety, health hazards, and the health of quarry workers (r = 0.940, p-value < 0.05), there also exists a very strong, positive and significant relationship between occupational hazards and psychological well-being of quarry workers with (r = 0.911, p-value < 0.05).

**Conclusion**: The study concluded that the level of awareness about occupational hazards was The study, recommends that employers provide more training.

**Keywords**: Occupational hazards, psychological well-being, quarry workers, accident prevention

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## Introduction

A proper work environment influences workers' attitude towards work, their yearning to participate in training processes within the working environment, and also dealing with staff interests at the workplace. Production involves technological know-how which is important to improve productivity and expend energy both physically and emotionally (Ugheoke Ebomoyi & Iyawe, 2016). If a staff enjoys the workplace as a safe, healthy, and happy place with supportive resources and facilities for working for optimal production, he or she tends to participate more than expected in the process of production (Alisimo, 2015).

The rate at which quarries are opening up in Nigeria is alarming without a corresponding knowledge of accident prevention, bearing in mind that a quarry is a place where workers are highly prone to injury every day. Nevertheless, despite the quarry industry's strategic importance, it is plagued with safety difficulties since it impacts how well personnel carry out their jobs. Despite the evidence required to manage health and safety proactively, some establishments do not give it the priority it deserves. Inadequate staff resources or lack of knowledge, skill, or desire may account for this problem(WHO, 2017., Gholami, *et al* 2020., Uroko & Grace 2020., Ghosh & Lohe, 2022). Cost is another significant problem, and businesses believe that they lack the resources needed to invest properly in health and safety and fail to recognize the significance of such an investment. The costs of safety failures in an establishment are also seldom measured or understood (Diego-Cordero et al, 2021).

According to Anju (2014), quarry workers and their industry are prone to accidents such as burns, finger cuts, fractures, nose bleeds, fainting, shocks, scalds, gassing, and suffocation. Joseph et al. (2017) noted that the agenda for accident prevention is achievable by the provision of infrastructure for services that protect workers. Maintenance and promotion of health are achieved through different combinations of physical, mental, and social well-being, which together are sometimes referred to as the "health triangle". Generally, the context in which an individual lives is of great importance for his/her health status and quality of life (Alexander, 2016). It is increasingly recognized that safety is maintained and improved not only through the advancement and application of health science but also through the efforts and intelligent lifestyle choices of the individual and society.

Protecting the safety, health, and welfare of those who are employed or are working is the focus of the field of occupational safety and health, which is also frequently referred to as occupational health and safety. Fostering a secure and healthy workplace is one of the objectives of occupational safety and health initiatives (WHO, 2017). Co-workers, family members, employers, clients, and numerous other people who can be impacted by the working environment may also be protected under occupational safety health (WHO, 2017). Workplace safety and health issues can be significant for ethical, legal, and monetary reasons.

Chemicals, biological agents, physical elements, unfavorable genetic conditions, allergens, a complicated web of safety dangers, and a wide range of psychosocial risk factors are only a few causes of hazards at work (Mojiminiyi, Merenu, Ibrahim, Njoku and Lung, 2018). Some recent risks to the health and safety of people at work include chemicals, biological agents, physical factors, adverse genomic conditions, allergens, a complex network of safety risks, and other large range of psycho-social risk factors (Mojiminiyi *et al*, 2018).

According to Araoye (2015), traumatic occupational injuries result in 10,000 fatalities worldwide, making them one of the leading causes of adult mortality and a significant cause of permanent disability in low-income nations like those in South Asia and Africa. The International Labor Organisation (ILO) estimates that 2.3 million women and men around the world have work-related accidents or diseases every year,

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which corresponds to over 6000 deaths every single day. Worldwide, there are around 340 million occupational accidents and 160 million victims of work-related illnesses annually (ILO, 2023)

According to the Nigerian Institute of Safety Professionals in 2000, in the quarry industry alone, a total of 11,000 individuals were hurt due to workplace accidents each year in Nigeria. The cost of accidents in agro-allied sectors in southwestern Nigeria was estimated by Omiyale et al.(2018) to be 87.89 million dollars every year.

Because it has one of the highest rates of work-related illnesses and injuries among all the occupational categories globally, the quarry industry has a reputation for being extremely unhealthy (Ezisi, Eze, Okoye and Arinze, 2017; Zermane, Tahir, Baharudin and Yusoff, 2023; Ismail, 2015).

The knowledge and awareness of hazard prevention measures among quarry workers is the concern of this project. This study aims to determine the degree to which quarry workers are aware of and understand safety procedures and to pinpoint any knowledge gaps that might be a factor in workplace mishaps. By identifying the weak points, intervention may be due to improved safety education and training, which will ultimately help quarry work in a safer environment and experience fewer workplace accidents in the Ijebu North local government area of Ogun state.

## Methods

The study was conducted between February and September 2022. It employed a cross-sectional survey research design because data were collected from respondents at a single point in time. The design was deliberately descriptive because it explained the topic investigated.

The population for the study comprised all the 120 staff of a quarry site in Ijebu North local government area of Ogun state Nigeria. The local government was purposively selected because that is the area where the quarry business was predominantly located as the inclusion criteria. This (n = 120) figure was obtained from the human resource department of the organization at the site where quarry activities are carried out. The method of selecting the sample from the population was based on a non-probabilistic sampling technique because these were the workers at the quarry companies in Oru/Ago-Iwoye areas where these quarry activities were going on at Ijebu-North local government area of Ogun state. These areas were chosen to administer the instrument, bearing in mind that the questionnaire would cut across various departments and units which were just the machine operators and the loaders.

This figure was obtained from the human resource department of the organization at the site where quarry activities are carried out. The method of selecting the sample from the population was based on the non-probabilistic purposive sampling technique.

The instrument for data collection was a structured questionnaire developed by the researchers and validated by scholars and experts in the field of occupational and community health education research the instrument contained two sections A and B, and reliability was also tested. Section A consisted of items used to describe the demographic characteristics of the respondents, including sex, and educational qualifications which were necessary indices for determining knowledge of safety strategies at work. Section B consisted of the Knowledge of Occupational Safety and Health Hazards Questionnaire (KOSHQ)(r = 0.75) with 10 questions drawn to elicit responses on the knowledge of using protective gears at work, how various machines work, belt protection, loading styles, operation of loading trucks and others, and the relationship between occupational hazards and psychological well-being questionnaire (ROHPWQ) (r = 0.84). The questionnaire contained items like the number of working hours per day, number of hours for break time, availability of welfare package like canteen, presence of insurance policy, etc. which were based on the objectives of the study to

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elicit information on the subject matter.

Data were collected using the primary mode of data collection through quantitative (questionnaire) means which were analyzed using descriptive and inferential statistics. The descriptive and inferential statistics on the collected data provided information such as frequency, simple percentage, and Pearson moment correlation method as statistical tools. Moreover, the statistical package for social sciences (SPSS) version 20.0 was utilized for data analys**is.**

## Results

According to demographic characteristics of the participants, 46 (38.3%) respondents were between 20 and29, 34 (28.3%) between 30 and39, 24 (20.0%) between 40 and49, 11 (9.2%) between 50 and59 and 5 (4.2%) participants were above 60. According to the findings, 46 (38.3%)of the subjects were between 20 and 29.

**Table 1.** Demographic characteristics of the respondents, including sex and educational qualifications

| Variables | | Frequency | Percentage | Valid percent | Cumulative percent |
|---|---|---|---|---|---|
| **Age** | 20-29 | 46 | 38.3 | 38.3 | 38.3 |
| | 30-39 | 34 | 28.3 | 28.3 | 66.7 |
| | 40-49 | 24 | 20.0 | 20.0 | 86.7 |
| | 50-59 | 11 | 9.2 | 9.2 | 95.8 |
| | 60 + | 5 | 4.2 | 4.2 | 100.0 |
| | **Total** | **120** | **100.0** | **100.0** | |
| **Sex** | Male | 78 | 65.0 | 65.0 | 65.0 |
| | Female | 42 | 35.0 | 35.0 | 100.0 |
| | **Total** | **120** | **100.0** | **100.0** | |
| **Educational Qualifications** | First leaving School Certificate | 39 | 32.5 | 32.5 | 32.5 |
| | WAEC/GCE/SSCE and Grade II | 46 | 38.3 | 38.3 | 70.8 |
| | OND/NCE/A' Level | 22 | 18.3 | 18.3 | 89.2 |
| | B. Sc/HND | 4 | 3.3 | 3.3 | 92.5 |
| | Postgraduate education | 9 | 7.5 | 7.5 | 100.0 |
| | **Total** | **120** | **100.0** | **100.0** | |

According to the findings, the majority of the respondents were between the ages of 20-29 years with 46 (38.3%).

Table 1 indicates that according to sex, 78 (65.0%) respondents were male while 42 (35.0%) were female, and The majority were males because the quarry business is male-dominated.

Table 1 further shows that according to educational qualifications, 39 (32.5%) of the subjects were holders of first leaving school certificates, 46 (38.3%)had WAEC/GCE/SSCE and grade II certificates, 22 (18.3%) were holders of OND/NCE/A' level, 4 (3.3%) had B.Sc./HND degree, and 9 (7.5%) had postgraduate degree**.** Findings revealed that the majority of the respondents (38.3%).had WAEC/GCE/SSCE and Grade II

**Table 2.** Correlation analysis on the relationship between the knowledge of occupational safety and health hazards and the psychological well-being of quarry workers

| | | |
|---|---|---|
| Knowledge of occupational safety and health hazards | Pearson correlation | 1 |
| | Sig. (2-tailed) | |
| | N | 120 |
| The health of quarry workers | Pearson Correlation | .940** |
| | Sig. (2-tailed) | .000 |
| | N | 120 |


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Table 2 indicates that there was a very strong, positive, and significant relationship between knowledge of occupational safety and health hazards and the health of quarry workers (r = 0.940, P-value < 0.05). This indicated a significant association between the knowledge of occupational safety and health hazards and the health of quarry workers. Therefore, the null hypothesis was rejected because results showed that there was a significant relationship between knowledge of occupational safety and health hazards and the health of quarry workers.

**Table 3.** Correlation analysis of the relationship between occupational hazards and the psychological well-being of quarry workers

| | | Occupational hazards | Psychological well-being of quarry workers |
|---|---|---|---|
| Occupational hazards | Pearson correlation | 1 | .911** |
| | Sig. (2-tailed) | | .000 |
| | N | 120 | 120 |
| Psychological well-being of quarry workers | Pearson correlation | .911** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 120 | 120 |

Table 3 demonstrates a very strong, positive, and significant relationship between occupational hazards and the psychological well-being of quarry workers (r = 0.911, p-value < 0.05).

## Discussion

This study set out to investigate the knowledge of occupational safety and health hazards among quarry workers in the Ijebu north local government area of Ogun state. Two hypotheses were formulated for the study. Hypothesis one stated that knowledge of occupational safety and health hazards had no significant relationship with the health of quarry workers; this hypothesis was rejected. Knowledge of occupational safety and health hazards had a significant relationship with the health of quarry workers in the Ijebu north local government area of Ogun state. This finding was in line with the study by Aigbokhaode, Isah, and Isara (2011), where most of the respondents were aware of protective measures, the commonest of which was safety devices. However, it was in contrast with Uroko and Grace's study (2020). They reported that a significant number of quarry workers were not knowledgeable about the health predisposition of their work. The devices listed under this included caution tapes, warning signs, safety slogans, notices, warning alarms, and gas or smoke detectors. This was important, as it had been documented that these safety devices helped to create safety awareness among workers. The finding from this study also aligned with the study by Asogwa and Dongo (2009); they reported that all the respondents abided by the factory's safety measures and instructions, and about three-quarters of them believed this was because of their safety. This indicated that the workers placed a high value on personal safety which was likely to reduce the incidence of work-related injuries and diseases. Most of the respondents (97.8%) used protective equipment, about 9 out of 10 used the protective equipment regularly, and the few that did not use protective gadgets were those who were not directly involved with the production.

The second hypothesis, which investigated whether occupational hazards had no significant relationship with the psychological well-being of quarry workers in the Ijebu north local government area of Ogun state, was also rejected; findings revealed a significant and strong relationship. This finding was in line with the studies of Al Neaimi et al. (2001) and Ghosh and Lohe, (2022) who found that almost all the respondents were aware of the hazards in the workplace and believed their occupation was dangerous This commendable

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development can reduce injuries and accidents at workplace. Similarly, findings from this study aligned with the report by Mwaiselage et al. (2005) who carried out a similar study in Tanzania where reports established that the most commonly known hazard by the subjects was quarry dust which was known by almost 8 out of 10 respondents, followed by noise (31.2%). The study was also in line with Gholami, *et al* (2020) which worked on the respiratory impact of dust quarry workers' health.

Limitations and strengths

One of the limitations of this study was the sample size which was small for a survey study that often requires a large sample size. In this case, the size of the sample may lead to underreporting of the knowledge of the quarry workers regarding safety precautions.

Despite the mentioned limitation, it is a new area of study in the study location regarding occupational health strategies.

## Conclusions

The level of awareness about occupational hazards is very high among the respondents, and the major source of awareness is on-the-job training regarding safety at work. There is a high level of compliance with safety measures with a modest prevalence of work-related injury, but the rate of periodic medical examination is low among the respondents.

This study concludes that the level of awareness regarding occupational hazards is high among the respondents, and the source of awareness is co-workers. Meanwhile, the respondents are not equipped with knowledge of safety measures to fully reduce occupational hazards. The study found that awareness is positively influenced by age, educational attainment, and work experience. This is not surprising because the high level of education facilitates easy assimilation of instructions; similarly, maturity and work experience are expected to increase awareness of occupational hazards.

Based on the strength and conclusions the study offers, the following are recommended for minimizing the attendants' occupational health hazards among quarry employees:

i. Quarry workers must have the required and adequate training to strengthen their knowledge regarding occupational health hazards and proper use of modern personal protective equipment (PPE). The employers should also maintain a healthy occupational environment, provide suitable and comfortable PPE, and enforce the use by all employees.

ii. The government should enforce proper working guidelines including the use of PPE at the workplace. Recruiting labor inspectors who inspect and report the health status of the workplace, injuries, and accidents should be encouraged.

iii. Management should adopt a periodic medical examination policy

iv. Adequate education, awareness campaigns, seminars, workshops, and training should be developed to sensitize employees on occupational health hazards posed by quarry activities.

v. Routine free medical examination of quarry workers to determine their health status at all times should be consistently implemented and enforced.

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## Conflict of interest

The researchers declared no conflict of interest.

## Funding

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## Ethical considerations

All ethical considerations have been observed.

## Code of ethics

Not applicable.

## Authors' contributions

Conceptualization, design, empirical review of the related literature, preparing the instrument for data collection, word processing/typesetting, and data collection were carried out by S. A. O.; proofreading, validation of the instrument for data

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collection, editing, and corrections of grammatical errors were done by J. F, while the manuscript was reviewed and approved by both S. A. O and J. F.

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