Fountain Journal of Basic Medical and Health Sciences (FUJBMHES), 2(1), **84-98.**

Assessment of Workers on Industrial Safety Practices and Environmental Health Hazards in Selected Manufacturing Companies in Ilorin West Local Government, Kwara, Nigeria

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Abstract

Background: The world of manufacturing is a complex and multifaceted one, with numerous factors at play that can impact the health and safety of workers, as well as the environment. **Objectives:** This study assessed workers' awareness of industrial safety practices and environmental health hazards in selected manufacturing companies in Ilorin West Local Government. **Methodology:** A cross-sectional design was used, which involved 120 workers from four manufacturing companies in Ilorin West Local Government, Kwara State, Nigeria. Data were collected through structured questionnaires, focus group discussions, and observational checklists. Data were analyzed using descriptive statistics and inferential analysis. **Results:** Findings indicate that 66.7% of workers had attended safety workshops and 60% had access to manuals, but gaps remained in training and chemical hazard recognition. Results revealed that industrial safety practices significantly reduce workplace hazards. Education level influenced safety awareness, with degree holders demonstrating stronger comprehension than workers with only secondary education. **Conclusion/Recommendations:** The study concludes that safety practices reduce workplace risks in Ilorin West Local Government, with reliable equipment, positive attitudes, and higher education levels improving worker safety awareness. It is recommended that organizations should provide regular practical training, promote a strong safety culture through worker involvement and open reporting, maintain adequate safety equipment, and design simple, practical training for less-educated workers.

Keywords: Environmental Health Hazards, PPE, Manufacturing Companies, Worker Training, Safety Attitudes, Ilorin West.

Introduction

Industrial safety practices and the management of environmental health hazards have become important areas of concern in the global manufacturing sector. The International Labour Organization (ILO, 2023) identifies the manufacturing industry as one of the most hazardous, exposing workers to a wide range of occupational risks, including chemical hazards, excessive noise, unsafe machinery, and waste pollution. Industrial safety is therefore fundamental in preventing accidents, safeguarding health, and ensuring a safe working environment (Gunjyal *et al*., 2023; Eriksson *et al*., 2024). Beyond reducing injuries and illnesses, effective safety practices also contribute to employee well-being, job satisfaction, and organizational productivity (World Health Organization, 2019; Okechukwu & Onyia, 2022). Nevertheless, workplace accidents remain a persistent issue, more pronounced in developing countries where enforcement of safety regulations is weak (ILO, 2023).

Several theoretical frameworks provide perspectives on the dynamics of industrial safety practices. The Health Belief Model explains how workers' perceptions of risk, severity, and benefits influence their compliance with safety protocols, including

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the use of personal protective equipment (Alyafei & Easton-Carr, 2024). In a related manner, the risk management framework continues to be applied in occupational safety research, emphasizing systematic processes for identifying and mitigating workplace hazards (da Rosa et al., 2021).

Empirical evidence further confirms the importance of workers' knowledge and attitudes in influencing safety practices. Studies reveal that employees with greater awareness of hazards and safety protocols are more likely to comply with regulations and report unsafe conditions (ILO, 2017; WHO, 2019). In contrast, negative attitudes toward safety, sometimes arising from perceptions that protocols are burdensome, contribute to non-compliance and increased workplace accidents (Mutegi *et al.,* 2023). At the organizational level, inadequate provision of personal protective equipment, insufficient training, and weak enforcement of safety policies remain widespread, particularly among small-to-medium enterprises (Akinbode *et al*., 2024). These shortcomings heighten exposure to occupational risks and contribute to recurring workplace casualties.

The consequences of poor safety practices are far-reaching. Workers exposed to hazardous substances, high noise levels, or unsafe equipment face increased risks of respiratory illnesses, hearing loss, cancers, and musculoskeletal disorders (ILO, 2020; National Institute for Occupational Safety and Health (NIOSH), 2022). Beyond physical harm, hazardous work environments also result in psychosocial issues such as stress, anxiety, and depression (American Psychological Association, 2020). The economic costs are substantial, with occupational injuries in Nigeria estimated to exceed ₦100 billion annually (NIOSH, 2022). Thus, both human and economic dimensions reinforce the urgency of addressing industrial safety in manufacturing sectors.

In Nigeria, the situation is highly concerning. The country's manufacturing sector continues to record high incidences of workplace accidents notwithstanding existing safety protocols and regulations (Olawepo *et al.,* 2021). Many workers lack adequate training on the handling of hazardous materials, while others display negative attitudes toward compliance, perceiving safety rules as inconvenient (Mutegi *et al.,* 2023). Moreover, companies frequently fail to provide sufficient resources, including personal protective equipment and training, thereby worsening the risks (Akinbode *et al.,* 2024). Within this context, production and casual workers remain disproportionately vulnerable. Though they represent a smaller proportion of the workforce, they account for the majority of workplace casualties due to the nature of their tasks and limited access to safety resources (Debela *et al.,* 2021).

The deteriorating state of industrial safety in *Nigeria*, most evident in manufacturing hubs such as Ilorin West Local Government Area, demonstrates the need for focused research. This study, therefore, examines workers' knowledge, attitudes, and the organizational provision of safety practices in selected manufacturing companies in Ilorin West Local Government, Kwara State.

Materials And Methods

Study Area

The study was conducted in Ilorin West Local Government Area (LGA), one of the administrative regions of Ilorin, which plays a significant role in the city's economic and industrial development. The LGA hosts numerous manufacturing companies that provide employment opportunities for production workers, technicians, and administrative staff. These companies contribute to the local economy but also expose workers to various occupational and environmental health hazards. Ilorin West LGA is geographically located at approximately 8° 29' 15" N latitude and 4° 31' 25" E longitude.

Study Design

The study adopted a survey research design, which allowed the collection of data from a representative sample of workers in manufacturing companies.

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Sample Size Determination and Sampling Technique

The target population consisted of casual and production workers employed in the 16 manufacturing companies in Ilorin West LGA. Using a factorial sampling formula, five companies were initially selected, but only four granted approvals. From these four companies, a total of 120 respondents were proportionally allocated based on workforce size. Respondents were selected using a systematic random sampling technique, focusing on casual and production workers who are directly involved in industrial processes and who are more exposed occupational hazards. This approach ensured fair representation across the companies and yielded valid, reliable, and generalizable results.

Data Collection Instrument

Data were collected using structured questionnaires, focus group discussions, and observational checklists.

Data Collection Procedure

Ethical approval was obtained and permission was also secured from the management before commencing data collection. Written informed consent was obtained from all participants after explaining the purpose, procedures, voluntary nature, and confidentiality of the study.

Statistical Analysis

This study adopted a multivariate data analysis approach involving data preparation, tabulation, and analysis. Data were cleaned and organised using Excel to ensure accuracy and effective management. ANOVA was employed as the primary statistical tool to assess differences in mean scores across multiple groups, including worker types, training levels, and companies, in line with the study's null hypotheses on knowledge, attitudes, and safety gadget adequacy.

Results

Socio-demographic information of manufacturing workers

Table 1 presented the demographic profile of the 120 workers. The gender distribution was fairly balanced, with 53.3% (64) male and 46.7% (56) female, ensuring representation from both groups. Most respondents (30.0%, 36) were aged 25–34, followed by 20.0% (24) aged 55 and above, and 18.3% (22) aged 45–54. Those under 25 accounted for 16.7% (20), while the smallest group was 35–44 years at 15.0% (18), reflecting a mix of younger and older workers. Regarding education, 61.7% (74) held Secondary School Certificates, 25.0% (30) had Bachelor's Degrees, and 13.3% (16) held Diplomas, indicating a workforce largely grounded in secondary education with some higher qualifications. In terms of experience, 33.3% (40) had less than one year, 23.3% (28) had 7–10 years, 21.7% (26) had 1–3 years, 11.7% (14) had 4–6 years, and 10.0% (12) had over 10 years, showing a predominance of relatively new employees alongside a smaller core of experienced staff. Job role distribution showed 58.3% (70) were production workers and 41.7% (50) casual workers, highlighting the reliance on both permanent and temporary labor within the sector.

Level of knowledge of industrial safety practices and environmental health hazards

Table 2 indicated generally high awareness levels but with some areas requiring improvement. Most respondents (88.3%) reported being aware of the safety protocols in place at their companies, while 11.7% were not. Training, however, was irregular: 38.3% of workers received training quarterly and 5.0% monthly, while 16.7% reported semi-annual training, 8.3% annual training, and 31.7% had never received any training. This suggests that although some employees are periodically updated on safety practices, many lack regular instruction. Awareness of personal protective equipment (PPE) was widespread, with 93.3% affirming familiarity, while 83.3% also demonstrated knowledge of emergency procedures, though 16.7% admitted uncertainty. Self-assessments revealed that 46.7% rated their knowledge as average, 28.3% as good, 8.3% as excellent, and 16.7% as poor, with none indicating very

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poor knowledge. When all parameters were combined into a composite knowledge score, as presented in Figure 1, employees were classified into high (35.0%), medium (46.7%), and low (18.3%) knowledge categories.

Table 1: Socio-demographic information of manufacturing workers

Variables	**Frequency**	**Percentage (%)**
Gender		
Male	64	53.3
Female	56	46.7
Total	120	100
Age		
Under 25	20	16.7
25-34	36	30.0
35-44	18	15.0
45-54	22	18.3
55 and above	24	20.0
Total	120	100
Educational Qualification		
Secondary School Certificate	74	61.67
Diploma	16	13.33
Bachelor's Degree	30	25.0
Total	120	100
Years of Experience		
Less than 1 year	40	33.3
1-3 years	26	21.7
4-6 years	14	11.7
7-10 years	28	23.3
More than 10 years	12	10.0
Total	120	100
Job Role		
Production workers	70	58.3
	50	41.7
Casual Workers		
Total	120	100

Table 2: level of knowledge of industrial safety practices and environmental health hazards

Opinions	**Frequency**	**Percent (%)**
Are you aware of the safety protocols in place at your manufacturing company?		
Yes	106	88.3
No	14	11.7
Total	120	100
How often do you receive training on industrial safety practices?		
Never	38	31.7
Annually	10	8.3
Semi-Annually	20	16.7

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Quarterly	46	38.3
Monthly	6	5.0
Total	120	100
Are you familiar with the use of personal protective equipment (PPE) in your workplace?		
Yes	112	93.3
No	8	6.7
Total	120	100
Do you know the procedures to follow in case of an emergency		
Yes	100	83.3
No	20	16.7
Total	120	100
How would you rate your overall knowledge of industrial safety practices?		
Excellent	10	8.3
Good	34	28.3
Average	56	46.7
Poor	20	16.7
Very Poor	0	0.0
Total	120	100

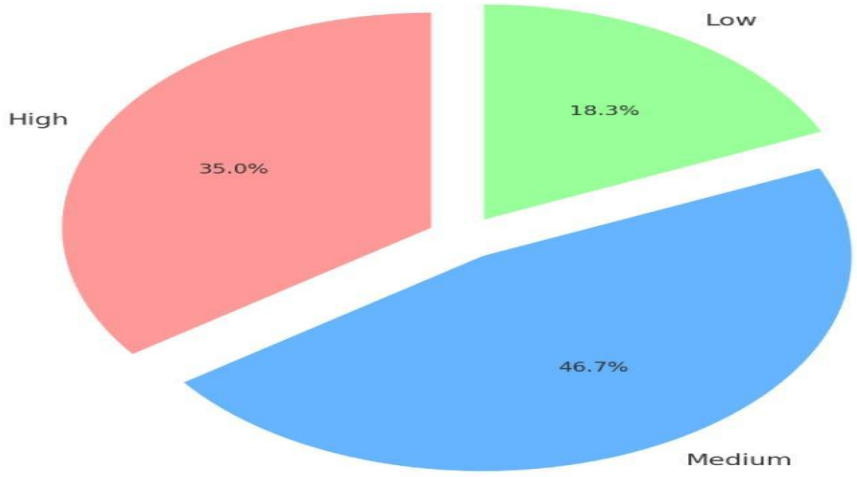

Figure 1: Pie Chart Distribution of Knowledge Parameter Levels Among Employees

Attitude of workers towards industrial safety practices and mitigating environmental health hazards

Table 3 shows the attitude of workers towards industrial safety practices and mitigating environmental health hazards. Most respondents (88.3%) were aware of safety protocols in their companies, while 11.7% were not. Training, however, was inconsistent: 38.3% received it quarterly, 5.0% monthly, 16.7% semi-annually, 8.3% annually, and 31.7% had never been trained. Awareness of personal protective equipment (PPE) was high, with 93.3% familiar with its use and 83.3% knowing the procedures to follow during emergencies. In terms of self-assessment, 46.7% of workers rated their knowledge as average, 28.3% as good, 16.7%

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as poor, and 8.3% as excellent, with none rating their knowledge as very poor.

The provision of safety gadgets and practices employed by selected manufacturing companies to minimise hazards

The findings from Table 4 indicated that 58.3% of workers received formal training on safety harnesses, while 41.7% did not. A higher proportion (70.0%) had fire extinguisher training, with 30.0% lacking such training. Competence in using personal protective equipment (PPE), such as helmets, was reported by 76.7% of respondents, while 23.3% felt less competent. Emergency evacuation drills showed varied participation: 30.0% practiced quarterly, 23.3% semi-annually, 20.0% annually, 16.7% monthly, and 10.0% never participated. Additionally, 65.0% of workers were skilled in identifying chemical spills, while 35.0% were not. These results suggest a generally positive engagement with safety practices, though gaps in training and drill participation highlight areas for improvement.

Self-assessed skills in lockout/tagout procedures to minimize machinery hazards

A bar chart in Figure 2 illustrated workers' self-assessed skills in lockout/tagout procedures to minimize machinery hazards: 36.7% rated their skills as good, 13.3% as excellent, 30.0% as average, 15.0% as poor, and 5.0% as very poor. This distribution indicates that nearly half of the workers rated their skills as average or below, underscoring the need for enhanced training in this critical safety area.

Table 3: Attitude towards Industrial Safety Practices and Mitigating Environmental Health Hazards

Opinions	**Frequency**	**Percent (%)**
How important do you believe industrial safety is in your daily operations?		
Extremely Important	40	33.3
Very Important	50	41.7
Moderately Important	20	16.7
Slightly Important	8	6.7
Not Important	2	1.6
Total	120	100
How often do you follow the safety protocols in your workplace?		
Always	48	40.0
Frequent	36	30.0
Sometimes	24	20.0
Rarely	8	6.7
Never	4	3.3
Total	120	100
Do you feel that your management prioritizes industrial safety?		
Strongly Agree	26	21.7
Agree	48	40.0
Neutral	20	16.7
Disagree	18	15.0
Strongly Disagree	8	6.7
Total	120	100

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Are you comfortable reporting safety violations or hazards in your workplace?		
Yes	86	71.7
No	34	28.3
Total	120	100
How confident are you in the safety measures implemented in your manufacturing company?		
Very Confident	22	18.3
Confident	52	43.3
Neutral	26	21.7
Not Confident	14	11.7
Not Very Confident	6	5.0
Total	120	100

Table 4: Provision of Safety Gadgets and Practices to Minimize Hazards

Opinions	**Frequency**	**Percentage (%)**
Have you received formal training on the use of safety harnesses to minimize fall hazards?		
Yes	70	58.3
No	50	41.7
Total	120	100
Have you received training on the use of fire extinguishers to minimize fire hazards?		
Yes	84	70.0
No	36	30.0
Total	120	100
Do you feel competent in using personal protective equipment like helmets to minimize head injury hazards?		
Yes	92	76.7
No	28	23.3
Total	120	100
How often do you practice safety drills for emergency evacuation to minimize risks during emergencies?		
Monthly	20	16.7
Quarterly	36	30.0
Semi-Annually	28	23.3
Annually	24	20.0
Never	12	10.0
Total	120	100
Are you skilled in identifying chemical spills to minimize chemical exposure hazards in the workplace?		
Yes	78	65.0
No	42	35.0
Total	120	100

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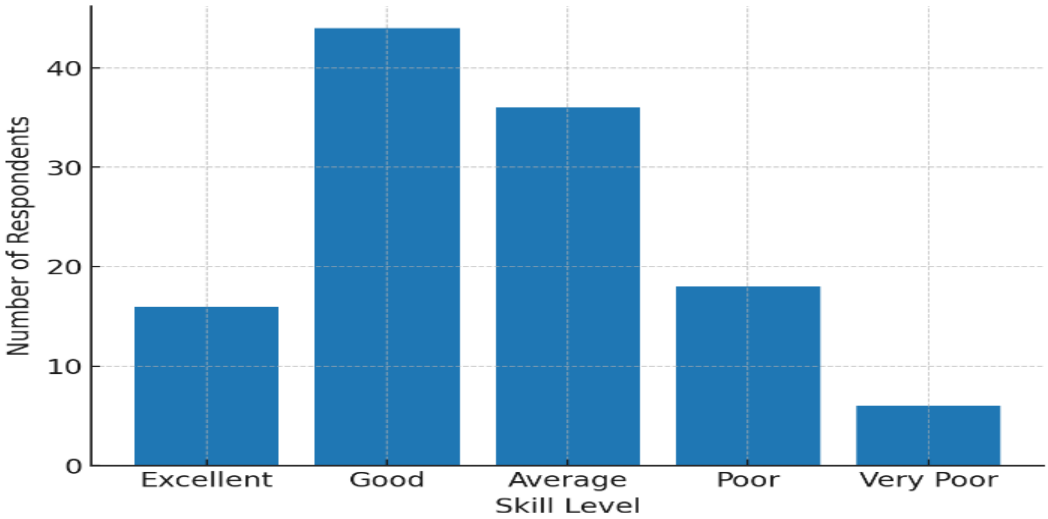

Figure 2: Self-assessed skills in lockout procedures to minimize machinery hazards

Focus Group Discussion: Analysis and Discussion

Focus group discussions (FGDs) were conducted with 24 participants, purposively selected from four manufacturing companies. This proportional selection reflected each company's contribution to the survey sample, ensuring fair representation. The participants were divided into four groups of six to facilitate interactive discussions and elicit diverse perspectives on industrial safety practices and environmental health hazards.

Knowledge of Safety Practices

The FGDs shown in Table 5 revealed that 83.3% of participants could accurately describe workplace safety protocols, indicating strong awareness, though 16.7% struggled with details. Safety training frequency varied, with 33.3% receiving annual training and 25.0% rarely or never trained. Familiarity with PPE was high (75.0%), but 25.0% reported limited familiarity. Confidence in emergency procedures was expressed by 58.3%, while 41.7% felt uncertain. Self-rated safety knowledge was predominantly average (41.7%) or good (33.3%), suggesting adequate but not exceptional understanding, with minor gaps in specific areas.

Attitude towards of Safety Practices

The focus group participants generally held positive attitudes toward safety in the workplace as seen in table 6. Most (66.7%) considered safety to be extremely or very important, with only a small minority downplaying its importance. When asked about the frequency of following safety protocols, the majority (58.3%) reported always or frequently adhering to protocols, though there were some inconsistencies in adherence, with 16.7% rarely or never following the protocols. Regarding willingness to report safety violations, most participants (66.7%) felt comfortable doing so, while 33.3% expressed hesitation, suggesting a need for a more supportive reporting environment.

Confidence in the current safety measures was mixed: 66.7% of participants were either very confident or confident, while 25% remained neutral, and a small group (8.3%) lacked confidence in the measures. In terms of willingness to participate in safety improvement initiatives, half of participants (50%) were very likely to join, with 33.3% likely to participate. The remaining 16.7% were either neutral or unlikely to join. This shows a strong interest in improving safety practices, though some workers may need

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further encouragement to engage more actively.

Provision of Safety Gadgets and Practices

Workplace safety training and equipment provision were generally positive but with certain shortcomings, as shown in Table 7. Two-thirds (66.7%) of participants received training on safety harnesses, while one-third (33.3%) had not. Fire preparedness was strong, with 75% trained in fire extinguisher use. Most workers (83.3%) felt confident using PPE such as helmets, though 16.7% did not. Evacuation drill participation was inconsistent: 8.3% joined monthly, 25% semi-annually, 33.3% annually, and 16.7% never. Confidence in spotting chemical spills was moderate (58.3%), with 41.7% uncertain. Lockout/tagout procedures showed mixed competence, with 33.3% rating their skills as average or poor, and only 8.3% as excellent. Preparedness for medical emergencies was fair, with 63.3% involved in first aid kit audits, while 36.7% were not. Half of participants felt confident training others on hazardous materials, highlighting the need for broader and more consistent safety training.

Research Hypotheses

Hypothesis One (H_{01}): There is no relationship between the knowledge of industrial safety practices and environmental health hazards

From Table 8, the hypothesis test showed a significant relationship between knowledge of industrial safety practices and environmental health hazards. With 2 degrees of freedom, the calculated F-value was 4.52 and the p-value was 0.010. As the p-value was below 0.05, the null hypothesis was rejected, indicating that knowledge of industrial safety practices significantly influences environmental health hazards.

Hypothesis Two (H_{02}): There is no relationship between the attitude of workers towards industrial safety practices and their compliance with safety protocols

As seen in Table 9, The hypothesis test revealed a significant relationship between workers' attitudes towards industrial safety practices and compliance with safety protocols. With 2 degrees of freedom, the F-value was 4.23 and the p-value was 0.015. As the p-value was below 0.05, the null hypothesis was rejected, indicating that workers' attitudes significantly influence compliance with safety protocols in the selected manufacturing companies in Ilorin West Local Government.

Table 5: Knowledge of Safety Practices

Indicator	Response Category	Frequency	Percentage (%)
Awareness of Safety Protocols	Can accurately describe	20	83.3
	Cannot fully describe	4	16.7
Total		24	100
Frequency of Safety Training	Monthly	4	16.7
	Quarterly	6	25
	Annually	8	33.3
	Rarely/Never	6	25
Total		24	100
Familiarity with PPE	Familiar	18	75
	Not familiar	6	25

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Total		24	100
Knowledge of Emergency Procedures	Confident	14	58.3
	Not confident	10	41.7
Total		24	100
Self-Rated Safety Knowledge	Excellent	4	16.7
	Good	8	33.3
	Average	10	41.7
	Poor	2	8.3
Total		24	100

Table 6: Attitude towards of Safety Practices

Indicator	**Response Category**	**Frequency**	**Percent (%)**
Importance of Safety	Extremely Important	10	41.7
	Very Important	6	25
	Moderately Important	4	16.7
	Slightly/Not Important	4	16.7
Total		24	100
Frequency of Following Protocols	Always	8	33.3
	Frequently	6	25
	Sometimes	6	25
	Rarely/Never	4	16.7
Total		24	100
Comfortable Reporting Violations	Yes	16	66.7
	No	8	33.3
Total		24	100
Confidence in Safety Measures	Very Confident	6	25
	Confident	10	41.7
	Neutral	6	25
	Not Confident	2	8.3
Total		24	100
Willingness to Join Safety Initiatives	Very Likely	12	50
	Likely	8	33.3
	Neutral/Unlikely	4	16.7
Total		24	100

Table 7: Provision of Safety Gadgets and Practices

Indicator	**Response Category**	**Frequency**	**Percent (%)**

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Training on Safety Harnesses	Yes	16	66.7
	No	8	33.3
Total		24	100
Training on Fire Extinguisher Use	Yes	18	75%
	No	6	25%
Total		24	100
Competent in Using PPE (Helmets, etc.)	Yes	20	83.3
	No	4	16.7
Total		24	100
Frequency of Evacuation Drills	Monthly	2	8.3
	Quarterly	4	16.7
	Semi-Annually	6	25
	Annually	8	33.3
	Never	4	16.7
Total		24	100
Skilled in Identifying Chemical Spills	Yes	14	58.3
	No	10	41.7
Total		24	100
Lockout/Tagout Skill Rating	Excellent	2	8.3
	Good	6	25
	Average	8	33.3
	Poor	8	33.3
Total		24	100

Table 8: ANOVA Test

Source	DF	SS	MS	F	p-value
Between Groups	2	20.35	10.18	4.52	0.010
Within Groups	118	116.28	2.04		
Total	**120**	**136.63**			

Table 9: ANOVA Test

Source	**DF**	**SS**	**MS**	**F**	**p-value**
Between Groups	2	18.42	9.21	4.23	0.015
Within Groups	118	124.57	2.19		
Total	**120**	**143.00**			

Discussion

The study showed that industrial safety practices significantly influence manufacturing operations in Ilorin West Local Government, affecting hazard reduction, worker compliance, and environmental health.

Knowledge of industrial safety practices and environmental health hazards

The ANOVA results revealed a statistically significant relationship ($p = 0.010$), thereby rejecting the null hypothesis. This implies that workers with higher knowledge of safety practices are better positioned to minimize

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environmental health risks. This finding aligns with Simeon & Aliu (2023) and Abatan *et al.* (2024), who emphasized that structured Environmental Health and Safety (EHS) training and awareness programs are critical in reducing environmental hazards in industrial workplaces. It further suggests that knowledge dissemination through training and manuals enhances hazard recognition and proactive response among workers.

Attitude of workers towards industrial safety practices and their compliance with safety protocols

The ANOVA test indicated a significant relationship ($p = 0.015$), confirming that workers' attitudes substantially shape their levels of compliance. In other words, workers who value and positively perceive safety practices are more likely to follow laid-down protocols. This finding is consistent with Anzagira *et al.* (2025), who noted that a positive safety culture fosters adherence to safety rules, and with Mohd Noor *et al.* (2025), who argued that workers' behavioural disposition remains one of the strongest predictors of safety compliance. The result underscores the need for management to foster a safety-oriented culture that strengthens workers' positive attitudes.

The provision and effectiveness of safety gadgets in minimising hazards

The results showed a statistically significant difference ($p = 0.008$), suggesting that adequate provision and effective use of safety gadgets play an important role in minimizing hazards. Companies that consistently supplied protective equipment and enforced its use recorded lower hazard incidences than those that did not. This outcome aligns with Adikwu *et al.* (2024) and Ezekiel *et al.* (2025), who found that safety gadgets such as PPE, monitoring devices, and protective wear directly reduce workplace accidents and environmental hazards. It also highlights the need for both provision and consistent enforcement in ensuring that gadgets achieve their intended purpose.

Conclusion and Recommendations

This study found that effective industrial safety practices, including clear protocols, adequate equipment, positive worker attitudes, and appropriate training, significantly reduce workplace and environmental health hazards in selected manufacturing companies in Ilorin West Local Government. Better-educated workers demonstrated higher safety awareness. Based on the findings of this study, the following recommendations are proposed:

- *Regular practical safety training*: Companies should provide regular, practical safety training for all workers.
- *Strengthen safety culture:* Promote a strong safety culture through open communication and worker involvement.
- *Ensure availability of safety equipment:* Ensure the availability and maintenance of quality safety equipment and PPE.
- *Targeted training for less-qualified workers:* Offer targeted, simplified training for less-qualified workers.

Research Implications of the Study

- The study highlights the need for increased awareness about industrial safety practices and their role in reducing environmental health hazards in manufacturing companies.
- The findings emphasize the importance of workers' knowledge and attitudes in determining compliance with safety protocols and reducing workplace accidents.
- The research demonstrates that provision of adequate safety equipment and regular training significantly minimize occupational hazards.
- The study provides evidence that educational qualifications influence safety awareness, suggesting the need for differentiated training approaches.

Study Limitations

- *Cross-sectional design:* The study employed a cross-sectional design, which captures data at a single point in time and cannot establish causal relationships.
- *Limited sample size:* The study was conducted with only 120 workers from four manufacturing companies, which may limit generalizability.

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❖ *Self-reported data:* The study relied on self-reported data from workers, which may be subject to response bias.

❖ *Geographic limitation*: The research was limited to Ilorin West Local Government Area, which may not represent all manufacturing contexts in Nigeria.

Ethical Approval

Ethical approval for this study was obtained from the Department of Environmental Health Science, Faculty of Allied Health Sciences, Kwara State University, Malete, Nigeria.

Informed Consent

Written informed consent was obtained from all participants prior to data collection. The purpose, procedures, voluntary nature, potential risks and benefits, and confidentiality measures of the study were clearly explained to all participants.

Acknowledgements

The authors express gratitude to the management of the four participating manufacturing companies in Ilorin West Local Government for granting permission to conduct this research. Special appreciation goes to all workers who voluntarily participated in the study.

Funding

This study received no external funding and was self-sponsored by the authors.

References

Abatan, A., Jacks, B. S., Ugwuanyi, E. D., Nwokediegwu, Z. Q. S., Obaigbena, A., Daraojimba, A. I., & Lottu, O. (2024). *The role of environmental health and safety practices in the automotive manufacturing industry*. Engineering Science & Technology Journal, 5(2), 531–542. https://doi.org/10.51594/estj.v5i2.830.

Adikwu, F. E., Esiri, A., Aderamo, A. T., & Akano, O. A. (2024). Leveraging digital technologies for health, safety, and environmental (HSE) management in industrial operations. International Journal of Academic Research in Social Sciences, 6(11), 1–15. https://doi.org/10.51594/ijarss.v6i11.1722

Akinbode, J. O., Ebeloku, A., Unuafe, F., & Akintunde-Adeyi, J. F. (2024). Health and safety issues in selected Nigerian medium-sized manufacturing firms. The Indonesian Journal of Occupational Safety and Health, 13(3), 334–342. https://doi.org/10.20473/ijosh.v13i3.2024.334-342

Alyafei, A., & Easton-Carr, R. (2024). *The Health Belief Model of behavior change*. In StatPearls. StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK531489/

American Psychological Association. (2020). Stress in America 2020: A national mental health crisis. https://www.apa.org/news/press/releases/stress/2020/report-october

Anzagira, L. F., Avogo, J. A., & Tengan, C. (2025). Impact of work safety culture on safety measures in construction firms: A systematic review. Scientific Journal of Engineering and Technology, 2(2), 1–8. https://doi.org/10.69739/sjet.v2i2.666

Beus, J. M., McCord, M. A., & Zohar, D. (2016). Workplace safety: A review and research synthesis. *Organizational Psychology Review, 6*(4), 352–381. https://doi.org/10.1177/2041386615626243

da Rosa, A. C. F., Leal, G. C. L., & de Souza, R. C. T. (2021). Risk management in occupational safety: A systematic mapping. *WORK: A Journal of Prevention, Assessment & Rehabilitation, 70*(1), 151–165. https://doi.org/10.3233/WOR-2135

ISSN: 1595-1693

Debela, M. B., Yenesew, M. A., & Motbainor, A. (2021). Prevalence of occupational injury among workers in the construction, manufacturing, and mining industries in Africa: A systematic review and meta-analysis. Journal of Occupational Health and Epidemiology, 10(2), 14–23.

Eriksson, K. M., Olsson, A. K., & Carlsson, L. (2024). Beyond lean production practices and Industry 4.0 technologies toward the human-centric Industry 5.0. Technological Sustainability, 3(3), 286–308. https://doi.org/10.1108/TECHS-11-2023-0049

Ezekiel, E. S., Owunna, I. B., Ogunkanmi, S. A., Anifowose, O., Ugwu, O. C., Ukem, C. A., & Oladunjoye, G. J. (2025). Smart PPE and wearable technology for enhancing worker safety in the oil and gas industry. IRE Journals, 8(8), 727–734.

Gunjyal, N., Rani, S., Lajayer, B. A., Senapathi, V., & Astatkie, T. (2023). A review of the effects of environmental hazards on humans, their remediation for sustainable development, and risk assessment. Environmental Monitoring and Assessment, 195(6), 795. https://doi.org/10.1007/s10661-023-11353-z

International Labour Organization (ILO). (2023). *Safety and health at work*. Geneva: ILO. Retrieved from https://www.ilo.org/safework.

International Labour Organization (ILO, 2019). Occupational safety and health in the manufacturing sector. https://www.ilo.org/occupational-safety-and-health-sectors-and-industries

International Labour Organization. (2017). Occupational safety and health in the manufacturing sector. https://www.ilo.org/occupational-safety-and-health-sectors-and-industries

International Labour Organization. (2020). Occupational safety and health in the manufacturing sector. https://www.ilo.org/occupational-safety-and-health-sectors-and-industries

Mohd Noor, N. A. A., Nik Him, N. F., Rashid, A., & Rasheed, R. (2024). Fostering a safety culture in manufacturing through safety behavior: A structural equation modelling approach. Journal of Safety and Sustainability, 1(2). https://doi.org/10.1016/j.jsasus.2024.03.001

Mutegi, T. M., Joshua, P. M., & Maina, J. K. (2023). Workplace safety, employee safety attitudes and employee productivity of manufacturing firms. SA Journal of Human Resource Management, 21(1), Article 1989. https://doi.org/10.4102/sajhrm.v21i0.1989

National Institute for Occupational Safety and Health. (2022). Worker safety and health in the United States: A review of the current state. Cincinnati, OH: National Institute for Occupational Safety and Health. https://www.cdc.gov/niosh/index.html

Okechukwu, E. U., & Onyia, A. C. (2022). Occupational health safety practices and employee performance in manufacturing firms in Enugu State. Contemporary Journal of Management, 4(2), 1–13. https://airjournal.org/cjm

Olawepo, Q., Seedat-Khan, M., & Ehiane, S. (2021). An overview of occupational safety and health systems in Nigeria. Alternation: Interdisciplinary Journal for the Study of the Arts and Humanities in Southern Africa, SP37, 190–223. https://doi.org/10.29086/2519-5476/2021/sp37a9

ISSN: 1595-1693

Panda, S., Balasudarsun, N. L., Jagajeevan, R., & Chitra, R. (2020). Total quality management – A review. *International Journal of Advances in Engineering and Management, 2*(10), 453–457. https://doi.org/10.35629/5252-0210453457.

Simeon, D., & Aliu, S. (2023). Dominant factors influencing the implementation of safety protocols in building project sites. Journal of Project Management Practice, 3(2), 17–30.

World Health Organization. (2019). Occupational health: A manual for primary health care workers. https://iris.who.int/bitstream/handle/10665/200733/dsa191.pdf

Citation*:*

Jimoh, K.B., Adiama, B.Y., Opasola, O.A., Giegbefumwen, M.K., Afolabi, O.S., Sulaimon, O.D. & Adaramoye, T.S., Ogunmola, D.T., Abdulkareem, A. (2026). Assessment of Occupational Hazards and Health Risks Among Workers in Kaidi Quarry Industry, Ohosu, Ovia North-East, Edo State, Nigeria. *Fountain Journal of Basic Medical and Health Sciences (FUJBMHES), 2(1), 84*-98.

ISSN: 1595-1693