Relationship between safety Awareness and Safety Compliance in Small and Medium Scale Enterprise in a Akwa-Ibom Nigeria

Abstract

The study aims to evaluate the relationshipbetween safety awareness and compliance with safety behaviours in small and medium-scale enterprises (SMEs) in Akwa-Ibom State, Nigeria. The study employed a purposive non-probability sampling technique combined with cluster sampling, surveying 179 respondents across various manufacturing sectors. Data were collected using the Occupational Safety and Compliance of SMEs Questionnaire (OSCSMEQ) and a safety audit checklist. Descriptive statistics, Pearson Correlation Analysis, and multiple linear regression were employed for data analysis. The findings revealed a critical need for improvement in job safety, coworker awareness, supervisor engagement, and management commitment within Akwa Ibom SMEs. Strong positive degree & level of significancebetween job safety awareness and compliance, coworker awareness and compliance and supervisor awareness and compliance underscore the significance of safety knowledge and leadership in shaping adherence to safety protocols. Top management's commitment emerges as a key influencer not only on compliance but also on worker satisfaction with safety programs.

Keywords:safety awareness, compliance, small medium enterprises, Pearson correlation analysis, multiple linear regression, Akwa-Ibom State

1. Introduction

Small and Medium Enterprises (SMEs) are indispensable drivers of economic growth, industrialization, and national development in Nigeria. These enterprises, characterized by a maximum asset base of 200 millionNaira, as defined by Sanusi[1]contribute significantly to job creation, tax payment, and corporate social responsibility. The nuanced definitions provided by scholars like [2] underscore the multifaceted nature of SMEs, encompassing businesses with revenues, assets, or employee numbers below specified thresholds.Dugolli[3] stated that small and medium-scale enterprises have a total workforce ranging from 10 to 250 workers.

In Nigeria's economic landscape, SMEs emerge as major catalysts for rapid economic growth, domestic capital creation, and the fortification of manufacturing industries [4]. With a typical employee count of less than 300, SMEs constitute a formidable force in the Nigerian economy. Their contributions extend beyond mere economic indicators, playing a pivotal role in building local capacity for entrepreneurship, technical skills, innovations, and competitive advantages [5]. This dual quantitative and qualitative characterization, as elucidated by Ojo [6], emphasizes the unique attributes that set SMEs apart from larger enterprises.

The global significance of SMEs is underscored by the [7], emphasizing their crucial role in business, job creation, and economic development. In the Nigerian context, a 2020 National Bureau of Statistics (NBS) report highlights the staggering count of SMEs, estimated at about 41.5 million, contributing nearly half of the total GDP and employing over 84% of the nation's workforce [8]. This numerical prominence, however, is juxtaposed with an escalating challenge faced by these enterprises –a surge in work-related accidents and hazards.

Akwa Ibom State, situated in the vibrant heart of Nigeria, encapsulates the broader struggles of SMEs. Intensive labour, inadequate safety awarenessand a pronounced lack of compliance with safety protocols have given rise to an alarming increase in injuries, accidents, and psychological imbalances in workplaces. This pressing issue demands urgent attention to ensure the holistic well-being of the workforce and the sustainable growth of SMEs in the region.Occupational safety emerges as a central tenet in this discourse, acknowledged not only as a requisite for business functionality but as a fundamental priority for human welfare. Lindholm et. al., [9] advocates future occupational safety. Also, additional emphasis is laid on increasing global concern for occupational safety, transcending mechanical hazards to encompass the entirety of the workplace environment. Despite the comprehensive guidelines provided by [10], Nigeria, and particularly Akwa Ibom state, grapples with a pervasive lack of safety practices and policies within SMEs.

In response to this critical gap, this research endeavours to conduct an in-depth exploration of the existing landscape of safety awareness, compliance, and satisfaction within Akwa Ibom SMEs. The study aims to dissect the components of occupational safety awareness, identify inherent challenges and propose actionable recommendations to enhance safety practices.

2. Methods

2.1 Participants

The participants in this study were drawn from Small and Medium Enterprises (SMEs) (Figure 1) involved in manufacturing activities, encompassing a diverse range such as bakeries, sachet and bottled water companies, carpentry workshops, toilet roll producers, soap manufacturers, filling stations, auto mechanic workshops, tailoring workshops, welding workshopsand small processing units. Given the focus on occupational health and safety in SMEs, the study targeted both local and foreign firms. The selection criteria were based on staff strength, with a preference for companies employing more than 10 workers. Respondents included human resource personnel, line/production supervisors and frontline workers.

The study employed a combination of purposive non-probability sampling and cluster sampling. Purposive sampling was utilized to select SMEs companies that would participate in the study, relying on the researcher's judgment and aligning with the research proposal's objectives. The appropriateness of this technique stemmed from the study's primary focus on occupational health and safety within SMEs. To ensure a comprehensive examination, local and foreign firms engaged in manufacturing were targeted.

The questionnaire distribution process involved sealed and re-sealable envelopes dispatched through the company’s hierarchy or secretariat. This method not only ensured confidentiality but also allowed for the elimination of businesses that wished to opt out of the study. Feedback mechanisms were established to address incomplete or incorrect questionnaire

submissions, enhancing the reliability and validity of the collected data. Notably, safety personnel were excluded from the respondent pool to mitigate potential biases in responses and foster a direct understanding of safety practices within the SMEs.

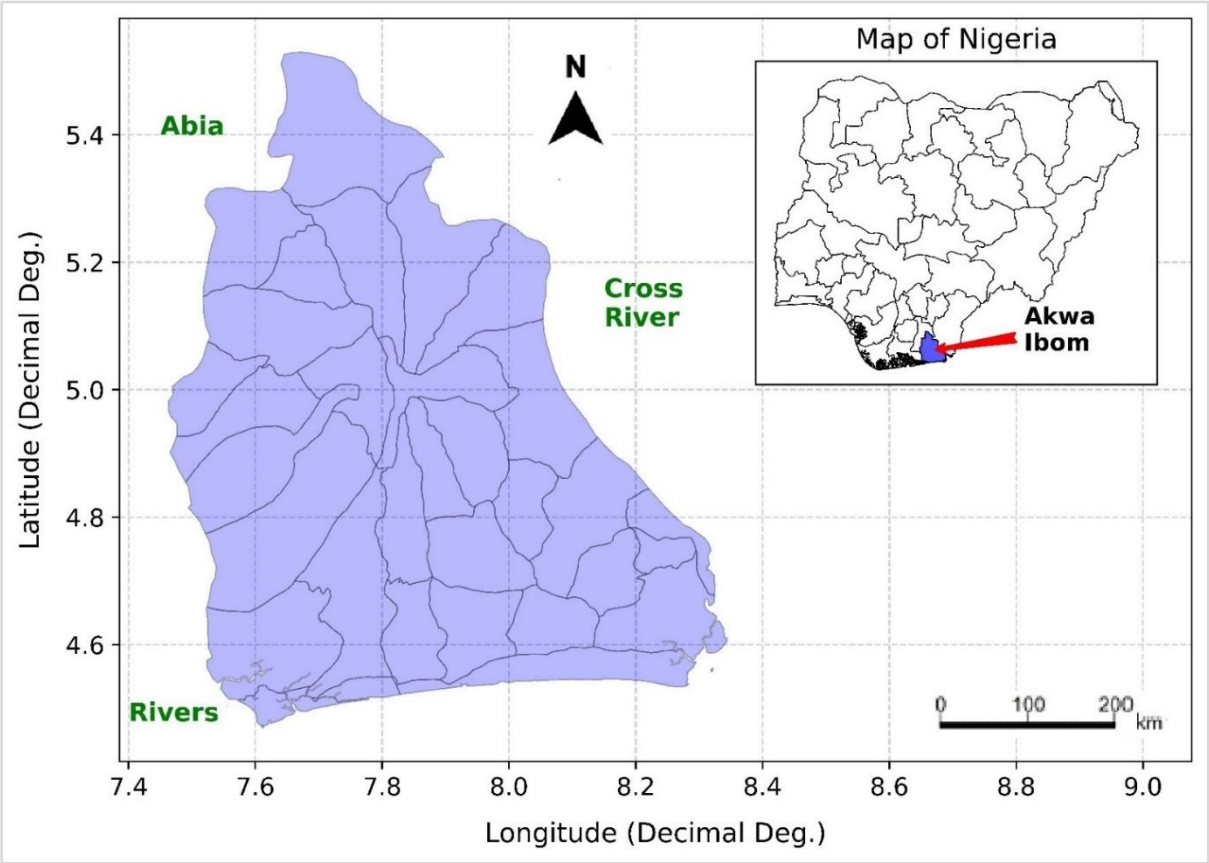

Figure 1: Map of the study area, Akwa-Ibom State in southern Nigeria

2.2 Instrument

This study utilized a structured questionnaire, the Occupational Safety and Compliance of SMEs Questionnaire (OSCSMEQ), as a primary instrument for data collection. The questionnaire employed a standardized and formal approach, incorporating a 5-point Likert scale. Respondents were required to express their views on safety awareness and incidents within the workplace, rating items on a scale from 1 to 5 (1 = strongly disagree, 5 = strongly agree). Each cluster within the questionnaire allowed for a minimum possible score of 10 and

a maximum possible score of 50. The OSCSMEQ comprised of seven sections, each addressing specific aspects related to occupational safety within SMEs:

Section A (Demographics of the Respondents): Capturing basic demographic information of the participants.

Section B (Level of Awareness of Job Safety): Focused on general knowledge of safety measures on the job, consciousness of workplace activities, awareness of risk factors, and measures to avert dangers.

Section C (Level of Awareness of Coworkers' Safety): Addressed knowledge of safety rules, concern for coworkers' safety, and promotion of a safe work environment for social well-being.

Section D (Level of Awareness of Supervisor Safety): Explored activities and behaviours displayed by supervisors that reflected safety awareness, such as praising safe work behaviours and rewarding safety practices.

Section E (Level of Awareness of Management Safety Practices): Examined practices like providing safety training programs, supplying safe equipment, maintaining clean work areas, and promptly investigating safety problems.

Section F (Satisfaction with Safety Programs): Explored employees' feelings of happiness or fulfilment with safety practices and procedures within their work environment.

Section G (Compliance with Safety Behaviours): Assessed adherence to safety rules and regulations, encompassing wearing safety equipment, following safety procedures, and reporting safety issues to supervisors.

2.3 Data analysis and procedures

The study employed descriptive statistics using XLSTAT for assessing occupational safety awareness levels. Pearson correlation analysis in IBM SPSS Statistics explored relationships between safety components. Regression analysis, also in IBM SPSS Statistics, delved into the predictive capacity of safety awareness on compliance. This multifaceted approach ensured a comprehensive understanding of occupational safety within SMEs.

3. Results

3.1 Demographic Variables

The study involved 179 respondents from two companies (A and B). In Company A, 82 respondents included 58 males and 24 females, while Company B had 97 respondents with 74 males and 23 females. Regarding age distribution, both companies had a combined total of 80 respondents below 30 years, 52 respondents aged 31-35 years, 34 respondents aged 36-40 years, and 13 respondents above 41 years. In terms of experience, Company A had 30 respondents with 0-5 years, 24 with 6-10 years, 17 with 11-15 years, and 11 with 16 and above years. Company B had 36 respondents with 0-5 years, 32 with 6-10 years, 18 with 11-15 years, and 11 with 16 and above years of experience**.**

3.2 Level of Occupational Safety Awareness in Akwa Ibom

The analysis of occupational safety awareness among SME workers in Akwa Ibom, as presented in Table 1, reveals insights into different facets of safety perception. Using a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), the mean scores and standard deviations provide a comprehensive understanding of the agreement levels.

Table 1: Descriptive statistic of level of Occupational Safety Awareness in Akwa Ibom

Variables	N	Mean	Std. Deviation
Job Safety Awareness	179	1.51	0.29
Coworkers Safety Awareness	179	1.72	0.23
Supervisor Safety Awareness	179	1.96	0.11

Management Safety Awareness	179	1.93	0.17
Satisfaction with Safety Program	179	1.95	0.13
Compliance with Safety Behaviour	179	1.68	0.19

Likert rating: 1=Strongly Disagree, 2= Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

3.3 Pearson Correlation Coefficient Distribution

The Pearson correlation analysis investigated relationships between various occupational safety awareness constructs, as shown in Table 2.

Table 2: Pearson Correlation between Occupational Safety Awareness Construct

Variables	JSA	CWSA	SSA	MSA	SSP	CSB
JSA	**1**					
CWSA	**0.410**	**1**				
SSA	-0.035	0.120	**1**			
MSA	-0.017	0.111	**0.978**	**1**		
SSP	-0.056	0.106	**0.898**	**0.878**	**1**	
CSB	**0.779**	**0.443**	**0.404**	**0.418**	**0.355**	**1**

Values in bold are different from 0 with a significance level alpha=0.05

3.4 Multiple Regression Modelling and Goodness of Fit

Table 3 displays the goodness of fit statistics for the multiple linear regression model predicting Compliance with Safety Behaviour (CSB). With 179 observations, the model explains 80.1% of the variance in CSB, as indicated by an R^2 of 0.801. The adjusted R^2 is 0.796, accounting for predictor variables. The Mean Squared Error (MSE) is 0.008, and the Root Mean Squared Error (RMSE) is 0.088, representing the average squared difference between observed and predicted values.

3.5 Analysis of Variance

Table 4 presents the Analysis of Variance (ANOVA), showing a statistically significant F-value (139.573, $p < 0.0001$), indicating the model's overall significance and at least one predictor significantly related to CSB.Table 5 provides unstandardized parameter estimates. Among predictors, JSA has the most significant impact on CSB (coefficient = 0.502, $p < 0.0001$), followed by CWSA (coefficient = 0.070, $p = 0.029$); SSA, MSA, and SSP are not statistically significant at the 0.05 level.

Table 3: Model Equations

Model Type	Model Equation
Multiple Linear Regression	CSB = -0.391 + 0.5025 JSA + 0.0701 CWSA + 0.297 SSA + 0.237 MSA + 0.077 SSP The adjusted R^2 is 0.796

Table 4: Analysis of Variance for Model

Source	DF	Sum of squares	Mean squares	F	Pr> F
Model	5	5.370	1.074	139.573	< 0.0001
Error	173	1.331	0.008		
Corrected Total	178	6.702			

Computed against model Y=Mean(Y)

Table 5: Model Parameter

Source	Value	Standard error	t	Pr> |t|	Lower bound (95%)	Upper bound (95%)
Intercept	-0.391	0.246	-1.590	0.114	-0.876	0.094
JSA	0.502	0.025	20.136	< 0.0001	0.453	0.552
CWSA	0.070	0.032	2.198	0.029	0.007	0.133
SSA	0.297	0.317	0.936	0.351	-0.329	0.923
MSA	0.237	0.182	1.303	0.194	-0.122	0.596
SSP	0.077	0.113	0.686	0.493	-0.145	0.300

4. Discussion

4.1Level of Occupational Safety Awareness in Akwa Ibom

Job safety awareness, reflecting the general knowledge of safety measures on a job, obtained a mean score of 1.51 (SD=0.29), indicating a prevailing disagreement with positive aspects and suggesting a need for enhancement in this domain. Kheni et al. [11] attributed poor occupational health and safety in SMEs to low literacy levels. The low literacy level of workers in SMEs will affect their awareness of safety concerning their jobs. Similarly, coworkers' safety awareness, focusing on knowledge of safety rules and fostering a safe work environment, garnered a mean score of 1.72 (SD=0.23), signifying a consensus among respondents for improvement.Supervisor safety awareness, encompassing behaviours reflecting safety consciousness, received a mean score of 1.96 (SD=0.11), emphasizing a predominant disagreement with positive aspects and signalling a need for improvement in supervisory safety practices.Management safety awareness, involving practices such as safety training and equipment provision, yielded a mean score of 1.93 (SD=0.17), indicating a prevailing disagreement and calling for improvements in management's safety-related initiatives.Kheni et al. [11] stated that owners/managers in SMEs more often ignore their responsibility to comply with OHS laws. They place the survival of the business above the safety of the workers. Management attitude toward safety is one of the most important factors that can directly shape the safety awareness of workers [12].Satisfaction with safety programs, gauging employee contentment with safety practices, achieved a mean score of 1.95 (SD=0.13), revealing a consensus of disagreement and highlighting areas for improvement in safety programs to enhance employee satisfaction.Dugolli [3] stated the importance of safety training for SME workers, as it enables the workers to understand ideal and safe working processes when executing their jobs.Finally, compliance with safety behaviour measures, focusing on adherence to safety rules, scored a mean of 1.68 (SD=0.19), suggesting a need for improvement in fostering compliance with safety policies within the workplace.

4.2 Pearson Correlation Coefficient Distribution

Given the Pearson correlation coefficients of Table 2, there exists a strong positive correlation between Job Safety Awareness (JSA) and Compliance with Safety Behaviour (CSB) (Correlation coefficient, r = 0.779), signifying that heightened job awareness correlates with increased compliance, and vice versa.Similarly, a positive correlation was observed between Coworkers' Safety Awareness (CWSA) and CSB (r = 0.443), indicating that heightened coworkers' safety awareness contributes to increased compliance with safety behaviour.While weak negative correlations were noted between JSA and Supervisor Safety Awareness (SSA) (r = -0.035) and JSA and Management Safety Awareness (MSA) (r = -0.017), these relationships were not statistically significant, suggesting no substantial evidence for a negative association.

A positive correlation between Supervisor Safety Awareness and CSB (r = 0.404) was statistically significant, implying that increased Supervisor Safety Awareness is linked to higher compliance with safety behaviour.Furthermore, a positive correlation was observed between Management Safety Awareness and CSB (r = 0.418), indicating that enhanced management commitment to safety correlates with increased compliance.Alias et al. [13] also stated that there was a significant positive relationship between employee commitment and safety compliance in SMEs. A positive correlation was found between MSA and Satisfaction with Safety Program (SSP) (r = 0.878), indicating that increased management safety awareness corresponds to higher satisfaction with safety programs among workers.Alias et al. [13] also established a positive relationship between employee commitment to safety and safety rules/policies. Strong positive correlations were identified between SSA and MSA (r = 0.978) and between SSA and SSP (r = 0.898), underscoring that heightened supervisor safety awareness is closely associated with increased management safety awareness and satisfaction with safety programs.

4.3 Relationship between safety awareness across job, coworker, supervisor, and organizational levels

The result from the correlation and regression findings from the study offers valuable insights into the dynamics of occupational safety awareness and compliance within Akwa Ibom SMEs. These key points shed light on critical aspects of the relationship between different variables:

The strong positive correlation between job safety awareness and compliance aligns with established research indicating that a robust understanding of safety measures is foundational for fostering compliant behaviour among workers. This underscores the imperative of equipping employees with comprehensive knowledge of potential job-related hazards, creating a basis for increased adherence to safety protocols.

The positive correlation between coworker awareness and compliance underscores the importance of promoting a collective safety culture within the workplace. Encouraging coworkers to be knowledgeable about safety rules and fostering an environment where individuals actively look out for each other's safety, contributes significantly to higher levels of compliance. This highlights the role of peer influence and cooperation in reinforcing a safe work atmosphere.The positive correlation between supervisor awareness and compliance emphasizes the pivotal role of supervisory leadership in driving compliance. Supervisors play a key role in overseeing safety measures, encouraging safe practices and holding workers accountable. This finding underscores the need for active engagement from supervisors in fostering a safety-conscious work environment.

Furthermore, the correlations between top management's awareness, supervisor awareness and program satisfaction underscore the influence of leadership commitment and organizational safety policies on overall compliance([11]; [13]). A commitment to safety

from top management positively impacts the attitudes and behaviours of supervisors and consequently, the satisfaction of workers with safety programs.

In terms of implications for Akwa Ibom SMEs, the multifaceted nature of initiatives needed for safety awareness across job, coworker, supervisor, and organizational levels is evident. This emphasizes the requirement for a holistic approach in designing and implementing effective safety programs. Leadership commitment, communicated through training programs and participative approaches, emerges as a critical factor in fostering a compliant safety culture.

5. Conclusion

In conclusion, this study underscores the pivotal role of job safety awareness in driving compliance within Akwa Ibom SMEs. Positive correlations between coworker and supervisor awareness further emphasize the importance of collective safety culture and leadership engagement. The study highlights the impact of top management's commitment on overall compliance and worker satisfaction with safety programs.

For Akwa Ibom SMEs, the findings advocate for a multifaceted approach, focusing on job-specific awareness, coworker collaboration, and active supervisor involvement. The research emphasizes the need for strong leadership commitment communicated through training to foster a participative safety culture. Such initiatives, tailored to SMEs' context, promise improved workplace safety, productivity, and overall workforce well-being. This research contributes valuable insights for creating safer work environments in SMEs.

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