



IMPACT OF SAFETY LEADERSHIP ON OCCUPATIONAL HEALTH AND SAFETY PERFORMANCE IN SELECTED OIL COMPANIES IN RIVERS STATE

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ABSTRACT: *This study aimed to determine the influence of safety leadership on occupational health and safety performance within Nigerian oil and gas businesses operating in Rivers State. This study employed Lewin's technique as the theoretical foundation, drawing upon trait theories. The study employed a descriptive cross-sectional research approach, specifically targeting a group of oil and gas firms (IOGC and IOC) situated in the Eleme, Port Harcourt, and Obio/Akpor LGA of Rivers State. The study encompassed 3,800 individuals employed by two distinct oil businesses, with a sample size of 380 people. The sample methods utilised in this study consisted of purposive or convenient sampling techniques. Data collection was conducted by administering a questionnaire adapted from a reference document provided by the International Association of Oil & Gas Producers (IOGP). The data was analysed using SPSS 25, using statistical techniques such as ANOVA and t-test. The findings of the study revealed a multitude of insights pertaining to the qualities of safety leadership. In relation to credibility, a significant proportion of participants from both the International Organisation of Governmental Control (IOGC) and International Oil Companies (IOCs) expressed the view that their respective leaders exhibited a deficiency in this attribute. The majority did not view feedback and recognition as highly evident, indicating another lacking characteristic. According to the respondents, the organisations under research did not exhibit a high presence of collaboration, which is seen as a trait of safety leadership. The aforementioned principle can also be extended to the domain of communication. Therefore, the study concluded that safety leadership is critical in influencing safety performance within the oil and gas industry. Nevertheless, the results indicate that there exists a perceived need for more specific leadership attributes among the executives within the firms under investigation. Addressing this deficiency has the potential to result in improved safety outcomes within these organisations.*

KEYWORDS: Safety Leadership, Occupational Health And Safety Performance, Oil Companies



INTRODUCTION

OGP (2013) stated that many major incident investigations in recent years have referred to management's lack of control on safety and the lack of improvement on asset integrity and operating practices as a root cause of the catastrophic personal, environmental, and economic losses that occurred. According to OGP (2013), the observed increase in the level of lagging performance indicators indicates the absence of visible commitment, accountability, and safety vision action orientation from the leaders. Similarly, the United States Department of Energy (US-DOE, 2012) further asserted that operations carried out in the oil and gas industry present many potential risks to people and the environment, some of which are inherent to the industry. Therefore, organisational management must be committed to excellence in safety, operational performance, and asset integrity through safety leadership qualities that will drive essential tools for preventing incidents (Geller, 2005). The best way for leaders to deliver that commitment is through the utilisation of a capable, competent, and motivated workforce that consistently executes operational activities built upon sound engineering and technical practices designed to enable safe, secure, and environmentally responsible outcomes (Krause, 2005; OGP, 2013; QSE, 2015). OGP (2013) further confirmed that companies can successfully maintain high standards in asset integrity and operational control with strong and positive safety leadership qualities. Krause (2005) and QSE (2015) asserted that understanding the relationship between the behaviours and actions of leaders and organisational safety culture and performance is essential to improve workplace safety and health as well as other business performance indicators such as quality, productivity, and profitability.

Safety leadership qualities that drive occupational health and safety performance among oil and gas industry operators need to be addressed in recent times due to extreme interest in cutting costs and making a profit or increasing production efficiency (Patrick, 2021). According to OGP (2013), credibility is a safety leadership quality and can be viewed as a quality a subordinate might attribute to their leaders after observing their behaviour and actions. Leaders begin developing trust by acting in ways that benefit their employees. Krause (2005) confirmed that a leader's competence alone, while necessary to enable the development of trust, does not result in trustworthiness. Trust is extremely difficult to gain and very fragile, such that once lost, it can be hard to recover (OGP, 2013).

Managing Occupational Health and Safety (OSH) effectively is critical to running a successful business. Managers have a legal and moral duty to safeguard the health and safety of those who work for them, and the exercise of these duties needs to be seen as central to the role of leadership (OSHA, 2012). Managers have a pivotal role in ensuring that occupational safety and health (OSH) policies and practices are given sufficient weight within their organisations. Research shows that how safety and health are led and integrated into an organisation can significantly impact well-being at work, including addressing problems of worker absence through ill health (EU-OSHA, 2012). According to Broadbent (2004), the safety behaviour of employees has two aspects: 'safety compliance' and 'safety participation'. Safety compliance concerns what employees are required to do to stay safe in the workplace (such as adhering to standard procedures or wearing protective clothing). Safety participation refers to actions to help develop a safer environment more generally (for example, participating in voluntary safety meetings or helping others stay safe). Safety leaders can positively influence encouraging and supporting safe and healthy behaviour among employees (O'Dea & Flin, 2001). Improving the safety behaviour of employees is an ambitious safety leadership goal (OGP, 2013).



Therefore, it is a huge concern in today's oil and gas industry operating environment to identify visible and effective approaches to establish a positive prevention culture to build a workforce intrinsically motivated by OSH (Patricks, 2021). Recent research in accident prevention has shown that compliance with safety and health regulations has only a minor effect on reducing accident rates (DOE, 2012). The main merit of regulation has been seen as putting safety and health on the agenda and reminding employers of their responsibility to keep employees safe and healthy (Walker, 2010). Once companies have implemented a safety and health system that ensures compliance with regulations, they can still drive down accident rates (HSE, 2001). Geller (2005) and Walker (2010) further stated that 80 to 90% of accidents are due to unsafe acts by individuals or groups rather than unsafe conditions. Hence, according to Krause (2005), safety leadership is key to improving OSH performance, which has to go beyond merely enforcing compliance with regulations.

Significant reduction in accident rates can only be achieved by creating a safety culture that leads to a shift in the attitudes of both leaders and employees by improving their safety behaviour (Cooper, 2001). Safety leaders who encourage safety participation in addition to safety compliance by creating a safety culture in which employees are continuously engaged in safeguarding their own safety and that of others are more likely to achieve a reduction in accident rates (Krause, 2005; Broadbent, 2004). This study considers how such important safety leadership qualities and responsible safety leadership actions can be better promoted among business leaders and explores practical steps that can be taken to improve occupational health and safety performance in the oil industry. The present study examined worker-level and senior managers' perceptions of safety leadership and their role in facilitating excellent safety performance in the Nigerian oil and gas industry.

Statement of the Problem

There have been several instances of the need for more credibility and better communication from leaders within most oil and gas companies operating in the study area regarding who takes responsibility for improving work site conditions, improving safety culture, and influencing or modifying workers' behaviour. This visible gap in giving a sense of direction or vision for an injury-free workplace has caused most of the increasing injury frequency rates experienced in most Nigerian oil and gas facilities. In addition, there has been growing concern about complacent attitudes and at-risk behaviours exhibited by most industry workers. There is a lack of intervention by way of feedback or even recognition to safe behaviours. Furthermore, it is part of the problem identified and observed for this study, which hinges on the need for leaders to demonstrate credibility. This is obvious because most leaders pay lip service to safety concerns or do not practice what they say in their everyday actions. Previous studies by Patricks (2021), DNV (2020), Energy Institute (2015), and Marlin *et al.* (2009) have revealed that unsafe behaviour contributes to about 85% of occupational accidents and injuries. According to Adugbo (2017), data collated from the Nigerian Department of Petroleum Resources (DPR) showed that fatalities in Nigerian upstream and downstream oil and gas industry operations increased from 21 in 2010 to 54 in 2015. These reported cases were fatal work-related incidents and might have been avoided through effective supervision and leadership commitment to daily safety improvement. Krause and Weekley (2005) affirmed that many organisations continue to have increasing injuries and fatalities. These great concerns and problems challenge safety leaders to ensure a lasting solution.

Aim and Objectives of the Study

This study aimed to ascertain the impact of safety leadership on occupational health and safety performance in Nigerian oil and gas companies operating in Rivers state.

The objectives of this study were to:

- i. Identify the safety leadership qualities that define a safety leader in Rivers state's selected oil and gas companies.
- ii. Evaluate the impact of safety leadership on the safety performance of selected oil companies in Rivers State.

METHODOLOGY

Study Area

This study adopted a descriptive cross-sectional study design. This study was conducted in selected oil and gas companies with operational sites and base offices located in three major local governments in Rivers State of Nigeria. These are Eleme, Port Harcourt and Obio/Akpor Local Government Areas (LGAs).

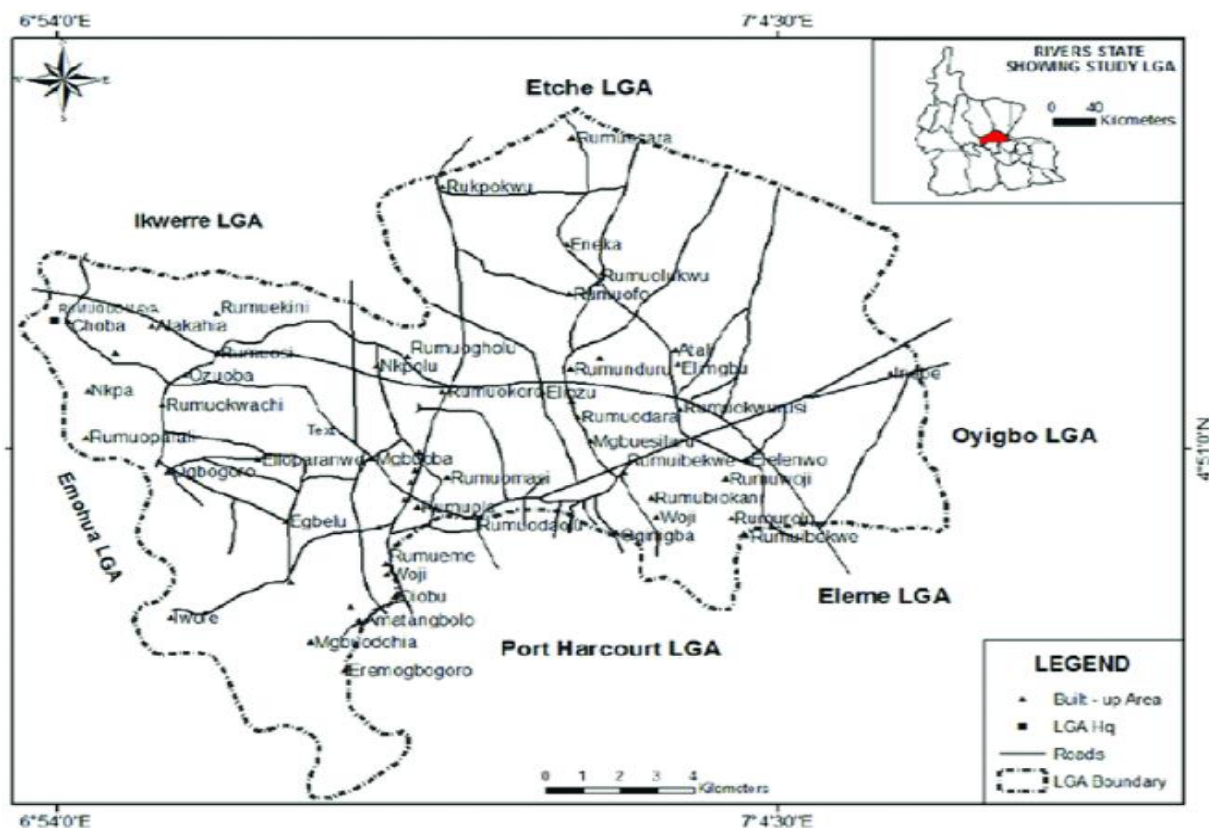


Figure 2.1: Map of Rivers State showing local Government areas (Google Maps.com)



Study Population and Sample Size

The study population consisted of an estimated 3,800 workers in the two oil companies operating in Rivers State, Nigeria. The sample size of this study was 380 employees, which was derived using the Taro Yamane Formula. Purposive or convenient sampling methods were adopted for this study. The Taro Yamane formula is described in Equation (3.1).

$$n = \frac{N}{1 + N(e)^2} \quad (3.1)$$

Where n= sample size

N= total population size (3,800)

e= Level of significance (0.05 for 95% Confidence Interval)

Applying the formulae, determined Sample size (n) =362

Method of Data Collection

In choosing the participants for this study, copies of the survey questionnaire were designed and administered using the 5-point Likert scale. The purposive sampling was also useful to ensure that this study met the inclusion and exclusion criteria. In this study, both primary and secondary data were used. The primary data was gathered using a questionnaire adapted and modified from IOGP (2013) Safety Leadership reference document No. 452 entitled “Shaping safety culture through Safety Leadership.” The questionnaire was designed using a modified 5-point Likert scale.

Statistical Analysis

The responses from the returned copies of questionnaires were entered into the SPSS Windows (Statistical Package for Social Sciences) database. The data were analysed on the computer using SPSS 25 version. Statistical methods used included analysis of variance (ANOVA) and sample t-test, which were applied to objective number 3 to determine the variation in safety leadership qualities across the selected oil companies (IOGC and IOC) in Rivers State.

RESULTS AND DISCUSSION

Credibility

The results in the table below show the level of agreement or disagreement from the respondents of the IOGC. It showed that 81.4% of respondents from the IOGC, in their response and by their perception and their feelings to the comments describing this safety leadership quality, disagreed that their leaders demonstrated credibility as a safety leadership quality considering the actions that describe what it takes to be a credible leader. In comparison, 1 8% agreed, 3.3% strongly disagreed, and 0.5% were Undecided. Similarly, 76.5% of the respondents from the IOCs respondents disagreed that credibility is a safety leadership quality. In comparison, 18.6% agreed, 3.3% strongly disagreed, and 1.6% strongly agreed with the



actions that describe credibility characteristic elements, as shown in the table below. This implies that leaders' credibility is not visible in the organisations being studied.

Table 1: Weighted Mean of Responses on Credibility

S/N	Item	Org.	S	A	U	D	SD	W.M	Remark
1.	What my leaders say is consistent with what they do.	IOGC	0	27	8	140	8	3.016	Accept
		IOCs	4	32	5	132	10	3.109	Accept
2	My leaders always admit mistakes to self and others.	IOGC	0	27	4	146	6	3.071	Accept
		IOCs	1	35	8	127	12	3.049	Accept
3	My leaders always give honest information about safety performance, even if it is not well received	IOGC	0	27	4	140	12	2.907	Accept
		IOCs	2	34	3	131	13	3.104	Accept
4	My leaders are always asking for ideas on how to improve performance	IOGC	1	28	5	138	11	3.049	Accept
		IOCs	4	36	4	125	14	3.120	Accept
5	My leaders are always following through on commitments	IOGC	0	28	1	145	9	3.093	Accept
		IOCs	1	34	3	136	9	3.115	Accept
6	My leaders are always acting consistently in any setting and applying safety standards.	IOGC	0	26	2	145	10	3.066	Accept
		IOCs	4	33	2	134	10	3.148	Accept
7	My leaders are willing to make safety related decisions that are unpopular.	IOGC	0	30	3	143	7	3.093	Accept
		IOCs	4	30	1	140	9	3.148	Accept

Feedback and Recognition

Table 2 shows respondents' perception from the IOGC and IOC regarding the characteristic actions that describe a safety leadership quality focused on giving feedback and recognition. From the results, the respondents from IOGC had 78.7% Disagree, 15.3% Agree, 5.5% strongly Disagree, and 0.5% strongly Agree. IOCs, on the other hand, had 73.8% Disagree, 19.1% Agree, 5.5% Strongly Disagree and 1.6% Strongly Agree. This revealed that respondents do not perceive their leaders demonstrating the safety leadership quality related to feedback and recognition across the two groups sampled.

Table 2a: Weighted Mean of responses on giving feedback and recognition

S/N	Item	Org.	SA	A	U	D	SD	W.M	Remark
1	My leaders always Focus on the behaviour, simply describing what the person is doing and what has been observed, not faults in the individual	IOGC	0	30	3	14	7	3.093	Accept
		IOCs	4	30	1	13	9	3.148	Accept



2	My leaders always describe the impact that the behaviour has, or could have, on others, and the possible consequence for them, their colleagues or the wider organisation.	IOGC	1	26	2	14	9	3.082	Accept
		IOCs	2	35	1	13	12	3.137	Accept
3	My leaders always Congratulate people for their safe behaviour.	IOGC	1	28	4	13	11	3.060	Accept
		IOCs	4	33	6	12	12	3.093	Accept

Collaboration

Table 3 shows the percentage of IOC/IOGC respondents who agree or disagree with characteristic actions that describe collaboration as a safety leadership quality. From Figure (10a), 80.9% of respondents from IOGC disagreed with collaboration characteristic actions that describe collaboration as safety leadership, 15.8% agreed, 3.3% strongly disagreed, and 2.7% strongly agreed. In the IOCs, 76.5% of the respondents disagreed, 19.1% agreed, 2.7% strongly disagreed, and 1.6% strongly agreed. This implied that the companies did not strongly perceive respondents' perception of the characteristic comments that describe collaboration as a safety leadership quality was not strongly perceived in the companies.

Table 3 Weighted Mean of responses on collaboration

S/N	Item	Org.	SA	A	U	D	SD	W.M	Remark
1	My leaders are always asking for, listening to, and showing that one values others' views	IOGC	0	29	3	142	9	3.077	Accept
		IOCs	6	34	3	133	7	3.180	Accept
2	My leaders are always open and honest about performance.	IOGC	0	29	0	145	9	3.109	Accept
		IOCs	0	38	4	132	9	3.115	Accept
3	My leaders are always showing a genuine concern for others' well-being	IOGC	0	28	0	148	7	3.115	Accept
		IOCs	2	36	3	136	6	3.153	Accept
4	My leaders are always encouraging the team to discuss safety concerns amongst themselves	IOGC	0	29	3	142	9	3.104	Accept
		IOCs	3	34	3	133	7	3.131	Accept



Communication

Figure 4 shows the percentage of IOGC respondents that agree or disagree to characteristic actions that describe effective communication as a safety leadership quality. In the IOGC, 80.9% of the respondents disagreed with communication as safety leadership, 15.8% agreed, 3.3% strongly disagreed, and 2.2% strongly agreed (Figure 11a). The IOCs had 76% of respondents that disagreed, 19.7% agreed, 2.2% strongly disagreed, and 2.2% strongly agreed. This represents a poor perception of how the respondents feel their leaders demonstrate communication as a safety leadership quality in the selected companies under study.

Table 4: Weighted mean of responses on Communication

S/N	Item	Org.	SA	A	U	D	SD	W.M	Remark.
1	My leaders clearly explain what is expected of each individual and how that relates to the wider safety vision and objectives of the organization. Safety should be communicated as a value, not as a priority, to be traded off against cost and schedule.	IOGC	1	28	5	140	5	3.060	Accept
		IOCs	5	34	1	138	1	3.202	Accept
2	Leaders give regular feedback and coaching on individuals' performance. A leader's timely, honest and constructive feedback enables individuals to improve.	IOGC	0	28	3	142	3	3.066	Accept
		IOCs	3	35	1	139	1	3.186	Accept

Impact of Safety Leadership on Safety Performance

Table 5 shows an R^2 value of 0.922 for the IOGC. The closer the value of R-square is to show it better fits the regression line and that safety leadership through any of the qualities will produce a remarkable impact on safety performance. This objective number 2 was achieved using the inferential statistics (regression analysis) tool because this tool helps determine the effect of one variable on another and can be used to make predictions of future outcomes of events. A multiple regression analysis was used to determine the impact of leadership on safety performance at the companies under study. The result revealed an adjusted R square value of 92.0% for IOGC and 89.6% for IOC, indicating a strong impact of leadership on safety performance in both companies. A one-point increase in feedback and recognition, vision, collaboration, and accountability will increase safety performance by approximately 0.2, 0.1, 0.4 and 0.03, respectively. However, feedback/recognition, collaboration, and accountability significantly impact safety performance at values of 0.005, 0.000 and 0.000, respectively. At IOGC, a 1% increase in credibility, feedback/recognition, vision, collaboration, communication, and accountability will increase safety performance by 0.02, 0.08, 0.5, 0.01,



0.1 and 0.2, respectively. Vision and accountability in the IOGC significantly impact safety performance at values of 0.000 and 0.01, respectively, which are both less than 0.05. The ANOVA tables of regression analysis revealed that leadership significantly impacts safety performance for both IOC and IOGC.

Table 5a. Result of regression analysis for IOGC

Model Summary^{a,c}

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.960 ^b	.922	.920	.117

a. Company Type = IOGC

b. Predictors: (Constant), ACCOUNTABILITY, CREDIBILITY, FEEDBACK_AND_RECOGNITION, COMMUNICATION, VISION, COLLABORATION

c. Dependent Variable: Impact_of_safety_leadership

Table 5b: Regression ANOVA^{a,b} for IOGC

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.461	6	743	349.067	.000 ^c
	Residual	2.392	176	.014		
	Total	30.852	182			

a. Company Type = IOGC

b. Dependent Variable: Impact_of_safety_leadership

c. Predictors: (Constant), ACCOUNTABILITY, CREDIBILITY, FEEDBACK_AND_RECOGNITION, COMMUNICATION, VISION, COLLABORATION

DISCUSSION OF RESULTS

Safety Leadership qualities that defines a safety leader

With respect to objective number 1, the results obtained from the two sampled companies (IOGC and IOC), and the analysis confirmed that the safety leadership qualities that define a safety leader include their ability to show credibility, give feedback and recognition, provide effective communication, be team-oriented and ensure collaboration, share vision for health and safety, and to demonstrate accountability. The respondents, in their responses based on their perception of how they feel their leaders demonstrate these qualities by judging against stated characteristics and elements that describe each safety leadership quality gave strong acceptance as more than 80 per cent of the respondents agreed to these qualities. These results agree with the findings of Quality Safety Edge (QSE, 2015) regarding five critical safety behaviours for safety leaders. The results also agree with the findings of Krause (2005) about the seven unique attributes and competencies of a safety leader. Furthermore, the results agree with the findings reported by OGP (2013) report number 452 about the characteristics of safety leaders. Finally, the results also agree with the findings of Walt Diangson and John Phillipone (2017) in their work focussed on safety leadership behaviours.



Impact of Safety Leadership on Safety Performance (Objective 2)

The findings show an R square value of 0.922 for the IOGC and an approximate value of 0.900 for IOCs. The closer the value of R-square is to 1, the better it fits the regression line and shows that safety leadership through any of the safety leadership qualities will produce a remarkable impact on safety performance. This objective was achieved using the inferential statistics (regression analysis) tool because this tool helps determine the effect of one variable (safety leadership), which is the independent variable, on another variable, safety performance, which is the dependent variable. Regression analysis results can be used to predict future events' outcomes within the sampled populations. A multiple regression analysis was used to determine the impact of safety leadership on safety performance at the companies under study. The result revealed an adjusted R square value of 92.0% for IOGC and 89.6% for IOC, indicating a strong impact of safety leadership on safety performance in both companies. This means that a one-point increase in the demonstration and practice of any safety leadership quality like feedback and recognition, sharing safety vision, collaboration and accountability will substantially increase safety performance by approximately 0.2, 0.1, 0.4 and 0.03, respectively. The resultant safety performance will be seen in lagging and leading performance indicators such as reduced neagree withd intervention, risk assessment, reduced medical treatment cases and, increased hazard identification, and anomaly reporting. However, feedback/recognition, collaboration and accountability have significant impacts on safety performance at values of 0.005, 0.000 and 0.000, respectively, supporting the findings of Geller (2021) that the ability to provide genuine and constructive feedback and positive motivation and recognition translates to better workplace safety performance.

At IOGC, a 1% increase in credibility, feedback/recognition, vision, collaboration, communication and accountability will increase safety performance by 0.02, 0.08, 0.5, 0.01, 0.1 and 0.2, respectively. Vision and accountability in the IOGC significantly impact safety performance at values of 0.000 and 0.01, respectively, which are both less than 0.05. The ANOVA tables of regression analysis revealed that safety leadership has a significant impact on safety performance for both IOC and IOGC. These results agree with the findings of major authors like Krause (2005) regarding the implication of safety leadership on organisational safety performance and the findings of Patricks (2017) regarding promoting safety performance through safety leadership. In addition, the results also agree with Krause and Weekley (2005), who stated that safety performance is a direct beneficiary of the quality of safety leadership exhibited in an organisation. Finally, the results further agree with Krause (2005) that the most important factor in predicting success of safety performance improvement initiatives lies in the quality of safety leadership provided and in the organisational culture that resulted and those of OGP (2013) that safety leadership plays a huge role in safety performance assessment and improvement for operations integrity assessments.

Validation of Hypothesis.

From the result of the correlation analysis, both null hypotheses were rejected, and the alternate hypothesis was accepted. The null hypothesis has been formulated to guide the study and was tested with an alpha value of 0.05 level of significance against determined P-values.

At a determined P-value of 0.001, the null hypothesis stating that there is no significant relationship between safety leadership and health and safety performance in the selected oil companies in Rivers State was rejected, while the alternate hypothesis was accepted, showing



a significant relationship between safety leadership and health and safety performance in the selected companies in Rivers state. Similarly, at a P-value of 0.001 less than the alpha value of 0.05, the next null hypothesis significantly impacts the relationship between safety leadership and organisational safety culture in the selected oil companies in Rivers State was also rejected, showing that there is a significant relationship between safety leadership and organisational safety culture.

CONCLUSION

The study concluded that safety leadership is an important component of occupational health and safety management requirement for organisational leaders to demonstrate their emotional commitment and values towards the wellbeing of their employees in order to achieve excellent safety performance like increased worker participation, compliance to safety rules, and reduction in near misses, injury frequencies, lost workday cases and fatality rates as well as to achieve desired production efficiency. Also, Safety leadership quality is an essential attribute for every organisational leader to have in order to drive a positive safety culture where personnel feel free to express their concerns about safety matters without fear of intimidation.

The study recommended that the management of the two sampled populations (IOC and IOGC) should pay more attention to improving the safety leadership qualities of their personnel, especially the frontline supervisors and line managers. Furthermore, an awareness workshop should be conducted to initiate programmes that better explain the benefits of safety leadership qualities and their impact on safety performance and organisational safety culture

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