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Leadership Styles and their Influence on Incidents and Accidents in Oil and Gas Operations in Nigeria

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Abstract: ***This study aimed to understand leadership styles and their impact on incidents and accidents in onshore and offshore oil operations in Nigeria. A mixed-methods approach was employed, integrating both quantitative and qualitative methods. Primary data was collected through a structured closed-ended questionnaire and interviews with 350 participants from various roles within oil and gas companies operating in the Niger Delta region of Nigeria. The study identified democratic and transformational leadership styles as the dominant leadership styles in the Nigerian oil and gas industry. Transformational leadership demonstrated a strong negative influence on accidents, indicating significantly lower accident rates in environments where this leadership style prevailed. In contrast, transactional leadership showed a positive correlation with accidents, suggesting a higher likelihood of accidents in environments characterized by this leadership style. The study highlighted the crucial role of safety behaviours as significant mediators between leadership styles and accidents. The findings suggest that transformational leadership is associated with safer work environments and reduced accidents in the Nigerian oil and gas industry. Conversely, transactional leadership is associated with increased accidents. Safety behaviours play a mediating role in the relationship between leadership styles and accidents. These findings have implications for the development of targeted interventions, such as leadership training programs, to foster safer work environments and reduce accidents in the Nigerian oil and gas industry.***

Keywords: Leadership style, accidents and incidents, oil and gas companies, safety behaviour, safety outcomes, health and safety

1. Introduction

The Nigerian oil and gas industry is a cornerstone of the Nigeria economy, contributing significantly to its revenue, foreign exchange earnings, and overall economic growth. As reported by Elenwo and Akankali (2014), this industry alone accounts for 90% of the nation's revenue. Beyond its economic impact, the sector plays a crucial role in Nigeria's industrialization and development. However, beneath the facade of economic prosperity, the industry faces a persistent challenge – safety incidents and accidents. The very nature of oil exploration, extraction, and transportation involves inherent risks, ranging from machinery-related accidents to potential environmental disasters like oil spills. Globally, the oil and gas industry records a high number of workplace injuries and fatalities, reflecting the industry's high-risk nature (Mearns & Yule, 2009). Disturbingly, both the United States and Nigeria have witnessed a concerning rise in fatalities in recent years, underlining the gravity of the safety situation (Wingate et al., 2023; DPR, 2018).

Occupational accidents often result from factors such as lack of training, inadequate supervision, and poor implementation of safety protocols (Khdair et al., 2011). This safety predicament has thrust the industry's safety record into the spotlight, raising concerns about the well-being of its workforce, ecological integrity, and the broader economy. To address these challenges, effective safety management practices are imperative. Crucially, the leadership style adopted by those in positions of authority within these organizations emerges as a pivotal factor in shaping organizational culture, workforce behaviour, and safety performance (Petersen, 2001).

Leadership styles, such as transformational, transactional, and laissez-faire, profoundly influence employee behaviour and engagement levels, directly impacting safety performance (Bass, 1985; Den Hartog et al., 1997). Safety performance, a measure of an organization's effectiveness in managing safety risks, encompasses both safety outcomes (accidents and incidents) and safety behaviour (compliance and participation) (Martínez-Córcoles et al., 2011; Neal et al., 2000; Vinodkumar&Bhasi, 2010). Research has consistently demonstrated the relationship between leadership style and safety performance, with transformational leadership positively linked to safety participation and transactional leadership positively associated with safety compliance (Clarke, 2013; Inness et al., 2010). However, the nuanced interplay between leadership styles and safety outcomes in the Nigerian oil and gas industry remains understudied. This research aims to fill this critical gap by investigating leadership styles and their direct impact on incidents and accidents within both onshore and offshore oil and gas operations in Nigeria.

1.1 Study Hypothesis

Leadership styles are presumed to significantly impact safety outcomes and behaviours in both onshore and offshore oil and gas operations in Nigeria. The hypothesis to be tested suggest that variations in leadership styles exert a notable influence on the safety performance of workers in these environments. The theoretical model for the study is shown in Figure 1.

- Null Hypothesis (H_o1): There is no significant relationship between leadership styles and safety outcomes in onshore and offshore oil and gas operations in Nigeria.
- Alternative Hypothesis (H_a1): Leadership styles have a significant influence on safety outcomes in onshore and offshore oil and gas operations in Nigeria.
- Null Hypothesis (H_o2): There is no significant relationship between leadership styles and safety behaviour among workers in onshore and offshore oil and gas operations in Nigeria.
- Alternative Hypothesis (H_a2): Leadership styles have a significant influence on safety behaviour among workers in onshore and offshore oil and gas operations in Nigeria.

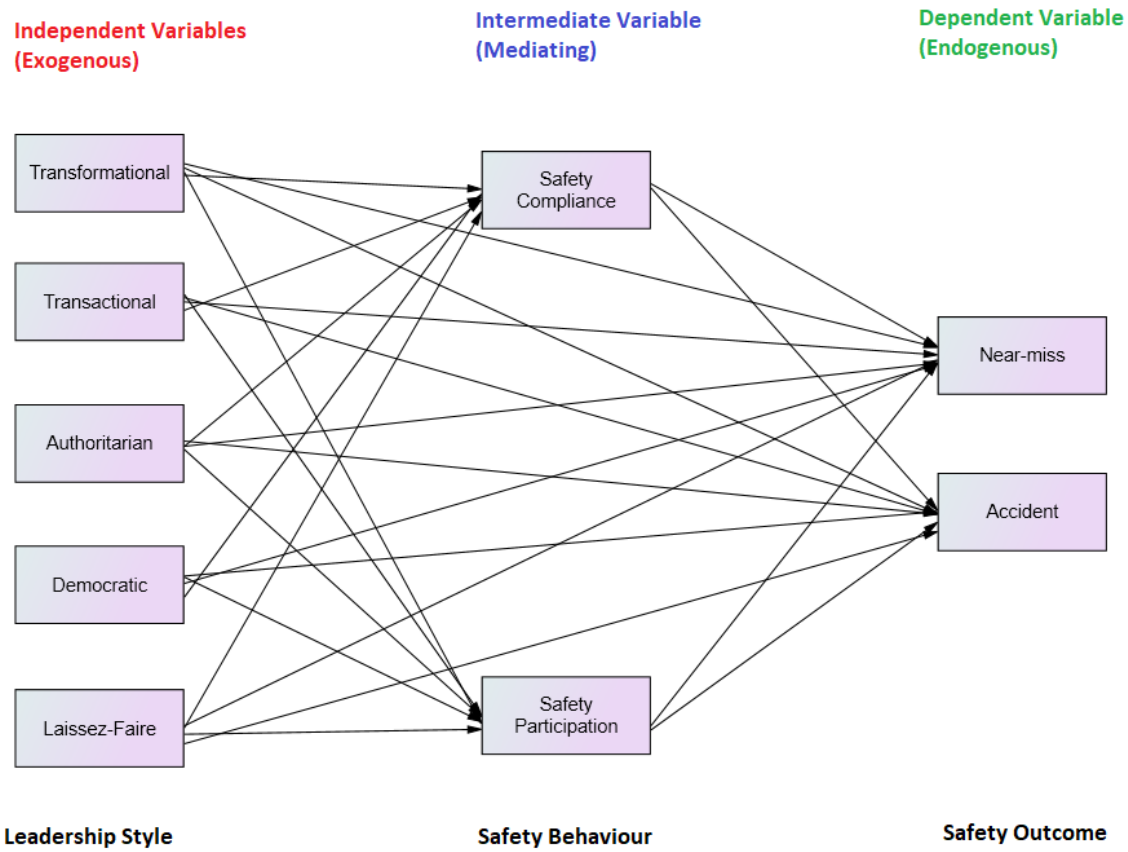

Figure 31: SEM model linking the exogenous and endogenous variables for theoretical model

2. Methods

2.1 Study Area

The research focused on the Niger Delta, located in the Southern region of Nigeria as shown in Figure 2. Spanning over 70,000 square kilometres and comprising nine states, this area is vital for its rich biodiversity and intricate network of creeks, rivers, and tributaries, making it one of the world's largest wetlands (Wikipedia, 2023). Notably, the Niger Delta region is a hub for oil and gas exploration and production activities, with several local and multinational companies operating within its boundaries. This area sustains a significant population, estimated to be over 30 million Nigerians (Ike &Emaziye, 2012).

The Niger Delta hosts diverse industrial activities, including oil fields, wells, pipelines, and related infrastructure. The region's economy heavily relies on the oil and gas industry, which significantly contributes to Nigeria's revenue and global oil supply. The oil and gas companies operating here are pivotal players in the nation's energy sector, engaging in exploration, extraction, transportation, and processing of hydrocarbon resources.

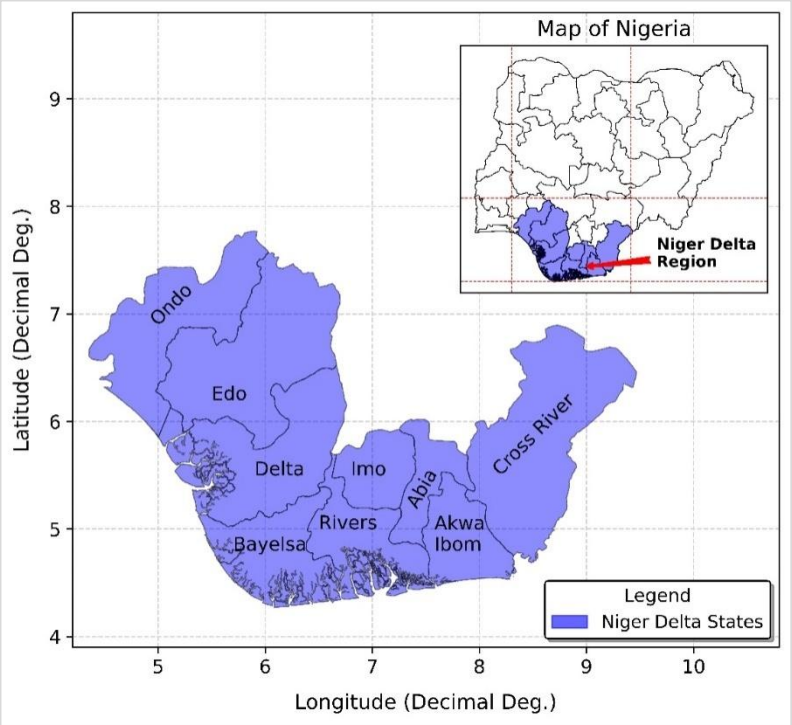

Figure 2: Map of Study Area

2.2 Participants

The participants that took part in the survey were oil and gas workers. Participants were selected from the oil and gas companies operating within the Niger Delta region. The selection of the oil and gas companies that participated in this study was meticulously executed through a non-probabilistic sampling technique. A convenience sampling technique was adopted in the selection of the oil and gas companies to participate in the survey. Four oil and gas companies were chosen to participate in the survey from the available pool of oil and gas companies operating within the region.

For the selection of the participants to take part in the questionnaire survey, a probabilistic sampling technique was adopted. Simple random sampling was employed in the selection of the participants to take part in the survey. The selected number of workers to partake in the survey were sent a copy of the questionnaire using an online questionnaire survey method (Google Form). The sample size required for the study was obtained using Cochran formula. The sample size obtained for the study was 350 participants.

2.3 Instrument

Participants were asked to evaluate the leadership styles demonstrated by their immediate supervisors within the Nigerian oil and gas industry. A five-point Likert scale was utilized, providing a comprehensive spectrum for participants to express their opinions. The scale ranged from 1 (Strongly Disagree) to 5 (Strongly Agree), allowing respondents to provide nuanced and detailed feedback on their perceptions of leadership styles

2.3.1 Leadership Styles Instrument

To comprehensively assess leadership styles within the oil and gas sector, a modified version of the Multifactor Leadership Questionnaire (MLQ) developed by Hartog et al. (1997) was employed. This questionnaire examined five leadership styles:

- Transformational Leadership: Measures a leader's ability to inspire and motivate followers, fostering a shared vision and encouraging individual growth. Example item: "My leader challenges me to look for creative ways to do my job."
- Transactional Leadership: Assesses the use of rewards, punishments, and clear expectations to ensure goal achievement and compliance. Example item: "My leader uses rewards and punishments to motivate me."
- Authoritarian Leadership: Gauges the extent to which a leader exercises strict control and expects unquestioning obedience from followers. Example item: "My leader is autocratic and does not allow input from employees."
- Democratic Leadership: Measures the degree to which a leader involves followers in decision-making, values their input, and promotes collaborative decision processes. Example item: "My leader encourages my input and listens to my ideas."
- Laissez-faire Leadership: Assesses the degree to which a leader provides little guidance, allowing followers to make decisions independently with minimal interference. Example item: "My leader is not very involved in my work."

2.3.2 Safety Behaviours Instrument

Safety behaviours, encompassing safety compliance and participation, were evaluated using items developed by Griffin and Neal (2000).

- Safety Compliance: Measures adherence to established safety protocols and procedures to ensure a safe working

environment. Example item: "I use my Personal Protective Equipment when working."

- Safety Participation: Assesses active engagement in safety-related activities and initiatives to contribute to a safer work environment. Example item: "I am willing to speak up about safety concerns."

2.3.3 Safety Outcomes Instrument

Two vital safety outcomes, Near Misses and Accidents, were explored to gather detailed information about past incidents.

- Near Miss: Measures instances where a potential accident or injury almost occurred but was narrowly avoided in the workplace. Example item: "I have been involved in a near miss when carrying out my duties."
- Accidents: Assesses actual unexpected incidents resulting in injuries, damage, or harm in the workplace. Example item: "I have been involved in an accident when carrying out my duties."

2.4 Data analysis and procedures

To test the study hypotheses, the responses obtained from the participants were subjected to various statistical analysis. The responses were entered into SPSS version 26 and coded appropriately. Descriptive statistic (mean and standard deviation) was done to understand the general overview of the participants on leadership style in the oil and gas industry in Nigeria. Pearson Correlation was used to understand the relationship between the leadership style, safety behaviour and outcome. Confirmatory Factor Analysis (CFA) was used to access the model fit. Both Composite Reliability and Average Variance Extracted were used in accessing the model fit. Structural Equation Modelling (SEM) was used to access the relationship between the leadership style and safety performance outcome. SPSS AMOS was used in performing both the CFA and SEM.

3. Results

3.1 Demographic Analysis

Analysing the participant composition revealed a male-dominated landscape in the industry, with 78.3% of respondents being male and 21.7% female. This gender disparity mirrors the sector's physically demanding nature, aligning with industry norms. In terms of education, 62.4% of respondents possessed a Post Graduate Degree, emphasizing the perspectives of highly educated professionals. Furthermore, 37.6% held a Bachelor's degree, showcasing a significant proportion of well-educated participants. Regarding age groups, a substantial 53.6% fell within 41 to 50 years, indicating a mature workforce. Additionally, 38.4% comprised individuals aged 51 to 60, highlighting an experienced segment. Notably, the age groups 18 to 30 and above 60 were not represented among the respondents.

3.2 Respondents View on Leadership style and safety performance in the Nigeria Oil and gas industry

Table 4.5 displays participants' mean responses regarding leadership styles, safety behaviours, and outcomes, offering crucial insights into their workplace perspectives. Participants generally viewed their leaders positively. Democratic Leadership emerged as dominant (Mean = 4.13, Std. Dev. = 0.71), signifying active involvement and collaborative decision-making. Transformational Leadership scored 4.10 (Std. Dev. = 0.79), indicating respondents recognized their leaders' inspirational qualities. Transactional Leadership received moderate agreement (Mean = 3.70, Std. Dev. = 0.79) regarding reward and punishment mechanisms. Opinions varied for Authoritarian Leadership (Mean = 3.01, Std. Dev. = 0.60), showing mixed perceptions. Laissez-faire Leadership was less prevalent, with participants desiring more direct involvement (Mean = 2.38, Std. Dev. = 0.71). Participants demonstrated strong commitment to safety. Safety Compliance scored high (Mean = 4.64, Std. Dev. = 0.42), indicating rigorous adherence to safety protocols. Safety Participation also received a high score (Mean = 4.60, Std. Dev. = 0.37), highlighting active engagement in safety activities. Participants disagreed with involvement in Accidents (Mean = 2.54, Std. Dev. = 1.15) and Near-Miss Incidents (Mean = 1.85, Std. Dev. = 0.67), indicating a perception of a safe work environment with rare incidents.

Table 4.5: Descriptive Statistics for Constructs

Groups	Constructs	Mean	Std. Dev.	Qualitative Ranking
Leadership Style	Transformational	4.10	0.79	Agreed that their leader exhibited transformation leadership style
	Transactional	3.70	0.79	Agreed that their leader exhibited some level of transactional leadership style
	Authoritarian	3.01	0.60	Most of the respondents were neutral about their leader been authoritative
	Democratic	4.13	0.71	Agreed that their leader exhibited a democratic leadership style
	Laissez faire	2.38	0.71	Disagree that their leader exhibited a Laissez faire leadership style
Safety Behaviour	Safety compliance	4.64	0.42	Most of the respondents strongly agree to complying with safety rules and regulation
	Safety participation	4.60	0.37	Most of the respondents strongly agreed to actively engaging in safety-related activities
Safety Outcomes	Accidents	2.54	1.15	Most of the respondent disagree to been involved in near miss
	Near-Miss	1.85	0.67	Most of the respondent disagree to been involved in an accidents

3.3 Relations between the leadership style, safety behaviour, and safety outcome

The Pearson correlation analysis is presented in Table 2. The result from Table 2 offers valuable insights into the intricate relationships among different leadership styles and safety-related factors amongst the respondents.

Transformational leadership exhibited a significant positive correlation with Transactional Leadership (TS) at 0.68, indicating a strong alignment between these leadership styles. This finding corroborated Hartog et al.'s (1997) research, highlighting the connection between transformational and transactional leadership. Additionally, Transformational Leadership displayed moderate positive correlations with Safety Compliance (SC) at 0.53. This suggested that leaders perceived as transformational tend to cultivate a culture of safety compliance within their teams. However, Transformational Leadership showed no significant correlations with Authoritarian (A), Democratic (D), or Laissez-Faire (LF) leadership styles, Safety Participation (SP), Near Miss (NM), or Accidents (AC).

Transactional Leadership demonstrated a robust positive correlation with Safety Compliance (SC) at 0.51, indicating that leaders with transactional attributes effectively enforce safety regulations and compliance. Furthermore, Transactional Leadership displayed moderate positive correlations with Safety Participation (SP) at 0.32, indicating encouragement of active participation in safety-related activities.

Authoritarian Leadership exhibited a weak negative correlation with Accidents (AC) at -0.14, although this relationship was not statistically significant. No significant correlations were found between Authoritarian Leadership and Transformational (TF), Transactional (TS), Democratic (D) leadership styles, Safety Compliance (SC), Safety Participation (SP), or Near Miss (NM).

Democratic Leadership displayed a positive correlation with Accidents (AC) at 0.32, signifying a tendency for this leadership style to be associated with more accidents in the oil and gas industry. There were no significant correlations between Democratic Leadership and Transformational (TF), Transactional (TS), Authoritarian (A) leadership styles, Safety Compliance (SC), Safety Participation (SP), or Near Miss (NM).

Interestingly, Laissez-Faire Leadership demonstrated a moderate positive correlation with Safety Participation (SC) at 0.35. This suggested that in situations where leaders adopt a hands-off approach, safety participation among team members tends to be high. Laissez-Faire Leadership, however, showed no significant correlations with Transformational (TF) and Transactional (TS) leadership styles, Democratic (D) leadership style, Safety Participation (SP), Near Miss (NM), or Accidents (AC).

Table 2: Pearson Correlation Coefficient showing relationship between construct

Variables	TF	TS	A	D	LF	SC	SP	NM	AC
TF	**1.00**								
TS	**0.68**	**1.00**							
A	0.27	0.22	**1.00**						
D	0.04	0.24	-0.03	**1.00**					
LF	0.21	0.19	**0.40**	0.11	**1.00**				
SC	**0.53**	**0.51**	0.07	0.20	0.19	**1.00**			
SP	0.22	**0.32**	0.20	0.12	**0.35**	**0.56**	**1.00**		
NM	-0.03	0.04	0.09	0.26	0.17	0.02	-0.09	**1.00**	
AC	-0.07	0.12	0.18	**0.32**	0.16	-0.02	-0.14	**0.43**	**1.00**

Values in bold are different from 0 with a significance level alpha=0.05. TF = Transformational, TS = Transactional, A = Authoritarian, D = Democratic, LF = Laissez Faire, SC = Safety Compliance, SP = Safety Participation, NM = Near miss, AC = Accidents.

3.4 Confirmatory Factor Analysis

The initial theoretical model exhibited suboptimal fit (CFI=0.684, GFI=0.579, RMSEA=0.121, SRMR=0.1408) as shown in Table 3. To enhance the model fit, revisions were undertaken.Revised Model 1 involved removing five items (TS1, A1, A3, LF1, and SP3) with standardized factor loadings below 0.6 as shown in Table 4.This adjustment yielded improved fit indices (CFI=0.760, GFI=0.636, RMSEA=0.12, SRMR=0.1085). Revised Model 2 introduced covariance between error terms 1 and 3, further refining the model. This enhancement led to significantly improved fit indices, achieving an acceptable model (CFI=0.910, GFI=0.905, RMSEA=0.083, SRMR=0.077). Additionally, the measurement model's validation was confirmed through Composite Reliability (CR) values above 0.7, indicating strong internal consistency for all constructs. The Average Variance Extracted (AVE) values, surpassing 0.5, indicated satisfactory convergent validity, ensuring accurate representation of latent constructs (Bagozzi& Yi, 1988). These modifications validated the reliability and validity of the measurement model, ensuring robust representation of underlying constructs.

Table 3: Goodness of Fit of the CFA Model

Models	χ^2	df	CMIN/df	CFI	GFI	RMSEA	SRMR
Initial Model	593.411	371	1.599	0.684	0.579	0.121	0.1408
Revised Model 1	389.705	241	1.617	0.760	0.636	0.123	0.1085
Revised Model 2	340.68	234	1.456	0.910	0.905	0.083	0.077

χ^2= Chi-Squared, df = degree of freedom, CFI = Comparative fit index, GFI = Goodness of fit index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized root mean square residual

Table 4: Standardized factor loading, Construct, and convergent validity

Constructs	Items	Standardized Factor loading (Initial Model)	Standardized Factor loading (Final Model)	CR	AVE
Transformational	TF1	0.701	0.659	0.813	0.597
	TF2	0.893	0.913		
	TF3	0.762	0.723		
Transactional	TS1	0.406	Deleted	0.867	0.685
	TS2	0.830	0.810		
	TS3	0.842	0.850		
	TS4	0.814	0.822		
Authoritarian	A1	-0.370	Deleted	0.772	0.629
	A2	0.809	0.818		
	A3	0.001	Deleted		
	A4	0.776	0.768		
Democratic	D1	0.768	0.772	0.898	0.690
	D2	0.883	0.887		
	D3	0.906	0.901		
	D4	0.753	0.751		
Laissez Faire	LF1	0.375	Deleted	0.884	0.690
	LF2	0.770	0.753		
	LF3	0.876	0.872		
	LF4	0.900	0.909		
Safety Compliance	SC1	0.813	0.820	0.800	0.573
	SC2	0.789	0.784		
	SC3	0.660	0.658		
Safety Participation	SP1	0.886	0.897	0.704	0.458
	SP2	0.543	0.534		
	SP3	0.374	Deleted		
	SP4	0.528	0.534		
Near miss	NM1	0.780	0.781	0.821	0.697
	NM2	0.888	0.885		
Accident	AC1	0.739	0.735	0.791	0.656
	AC2	0.866	0.878		

CR = Composite Reliability, AVE = Average Variance Extracted

3.5 Structural Equation Modeling

Null Hypothesis: There is no significant relationship between leadership style and safety behaviour (Safety Compliance and Participation) among workers in the Nigerian oil and gas industry.

The analysis of leadership styles and safety behaviour among Nigerian oil and gas industry workers revealed nuanced associations, as depicted in Table 5. Transformational Leadership demonstrated a positive, significant relationship with Safety Compliance (0.490*), indicating increased adherence to safety protocols. However, its impact on Safety Participation was weaker (0.192), suggesting limited influence on active safety engagement. Transactional Leadership positively influenced Safety Participation (0.860*) but had a weaker effect on Safety Compliance (0.192), emphasizing its role in encouraging active safety engagement rather than strict compliance. Authoritarian Leadership showed non-significant relationships with both Safety Participation (-0.015) and Safety Compliance (-0.129), indicating negligible impact on employees' safety behaviour.

Democratic Leadership displayed a minor positive link with Safety Compliance (0.096) but a negligible negative association with Safety Participation (-0.116), although neither relationship was statistically significant. Laissez-Faire Leadership exhibited a positive, non-significant connection with Safety Participation (0.330) but had a limited impact on Safety Compliance (0.110), suggesting a tendency for active safety participation without significant compliance.

The SEM results indicated that leadership styles have varying effects on safety behaviour within the Nigerian oil industry. While Transformational Leadership promotes safety compliance, it may reduce participation. Transactional Leadership strongly influences participation but has a weaker effect on compliance. Overall, the findings reject the null hypothesis, confirming the influence of leadership styles on workers' safety behaviour in the oil and gas industry.

Table 5: Standardized path estimates between exogenous variables (leadership styles) and exogenous variables (Safety Compliance and Participation)

Independent Variables	Dependent Variables	
	Safety Participation	Safety Compliance
Transformational	-0.433	0.490*
Transactional	0.860*	0.192
Authoritarian	-0.015	-0.129
Democratic	-0.116	0.096
Laissez faire	0.330	0.110

* = p<0.1, ** = p<0.05, *** = p<0.01

Null Hypothesis: There is no significant relationship between leadership styles and the safety outcome in the Nigerian oil and gas industry

The analysis of leadership styles and safety outcomes (Near Misses and Accidents) in the Nigerian oil industry reveals

distinct patterns, as illustrated in Table 6. Transformational Leadership significantly reduces Accidents (-1.496***), indicating a lower incidence in environments where this leadership style prevails. However, it doesn't notably impact Near Misses (-0.789), suggesting limited influence on potential accident detection.Transactional Leadership positively influences Accidents (1.293**), indicating a higher likelihood of accidents in environments dominated by this style. It also weakly impacts Near Misses (0.250), although not statistically significant. Authoritarian Leadership has a positive impact on Accidents (0.351*) and a weaker relationship with Near Misses (0.303), suggesting a slightly higher accident incidence under this style. Democratic Leadership shows a positive association with Near Misses (0.245*), indicating a potential decrease in their detection. However, its effect on Accidents (0.061) is negligible. Laissez-faire Leadership correlates positively with Accidents (0.282*) but has a minimal impact on Near Misses (-0.030), suggesting a higher likelihood of accidents in laissez-faire environments without significant influence on near miss detection.

The SEM result indicated that Transformational Leadership reduces accidents significantly, whereas Transactional Leadership increases accident likelihood in the Nigerian oil and gas industry. Authoritarian Leadership raises the chance of accidents, and Democratic Leadership might decrease near miss detection. The SEM results provide substantial evidence to reject the null hypothesis, confirming the influence of leadership styles on safety outcomes in the industry.

Table 6: Standardized path estimates between exogenous variables (leadership styles) and exogenous variables (Near misses and Accidents)

Independent Variables	Dependent Variables	
	Accident	Near miss
Transformational	-1.496***	-0.789
Transactional	1.293**	0.250
Authoritarian	0.351*	0.303
Democratic	0.061	0.245*
Laissez faire	0.282*	-0.030

* = p<0.1, ** = p<0.05, *** = p<0.01

4. Discussion

4.1 Prevalence of Leadership Styles and Safety Behaviour in the Nigerian Oil and Gas Industry

The study examined leadership styles and safety behaviours among oil and gas workers in Nigeria. Democratic leadership, emphasizing collaboration, emerged as the dominant style in the Nigeria oil and gas industry, fostering a sense of inclusion and value among employees (Chio, 2007). Transformational leadership focusing on inspiration and high standards was the second prevalent leadership style in the industry.Several studies have shown that transformational leadership style positively impact safety performance (Al Busaidi, 2020; Clarke, 2013; Inness et al., 2010; Koh et al., 1995; Zohar, 2002). Transactional leadership was the third leadership style noted by the participants. The leadership style which employs rewards and punishments demonstrated moderate influence on positive behaviours (Clarke, 2013).

Authoritarian leadership's impact varied among participants, highlighting its complexity (Kiazad et al., 2010). Laissez-faire leadership a hands-off approach was the least prevalent leadership style in the Nigeria oil and gas industry. Safety Compliance and Participation scores were high, reflecting a safety-conscious workforce. However, caution was advised in interpreting safety outcome data through questionnaire study due to potential underreporting (Zohar, 2000).The dominance of democratic and transformational leadership styles in this study, coupled with a strong safety culture and active safety engagement, underscores the industry's commitment to fostering a secure work environment

4.2 Relationship between Leadership Style and Safety Behaviour

The result of the Pearson correlation and SEM shed light on the intricate relationship between leadership styles and safety behaviour among oil and gas workers in Nigeria. The findings revealed the interplay between different leadership approaches and employees' adherence to safety protocols and active engagement in safety-related activities.

Transformational leaders, characterized by their ability to inspire and motivate their teams, were found to have a positive influence on safety compliance. This implies that under transformational leadership, workers are more likely to follow safety rules and regulations diligently. Barling et al. (2002) found similar relationship between transformational leader and safety compliance. They stated that transformational leaders may be more likely to create a safety culture in which employees are motivated and engaged in safety compliance. In term of safety participation, the relationship obtained for this study was contrary to what was obtained for safety compliance. Transformational leadership style seemed to be associated with lower participation in safety-related activities but this relationship was not statistically significant. Some studies found that transformational leadership tends to increase safety participation (Clarke, 2013; Inness et al., 2010; Koh et al., 1995; Zohar, 2002).

Transactional leaders, who emphasize rewards and punishments based on performance, exhibited a strong impact on safety participation. In environments where transactional leadership is prevalent, employees tend to actively engage in safety-related tasks and activities.Clarke, (2013)stated that transactional leadership was directly and positively related to safety compliance. This difference in the relationships might be attributed to geographic area and what workers place value more on. However, in this study transactional leadership style had a weaker influence on safety compliance, implying that while employees might participate actively, their adherence to specific safety protocols might not be as stringent. This could indicate a tendency for employees to engage in safety-related activities voluntarily but not necessarily follow all safety guidelines consistently.

Authoritarian leadership, characterized by strict control, did not significantly influence either safety compliance or safety participation. This suggests that this leadership style does not significantly impact employees' safety behaviour. Workers under authoritarian leaders did not show a strong inclination towards or against safety rules and activities, indicating a neutral effect on safety-related behaviours. Democratic leadership, emphasizing collaboration and participation in decision-making, showed a minor positive association with safety compliance and a negligible negative association with safety participation. However, these relationships were not statistically significant, implying that democratic leadership does not strongly sway employees' safety behaviours. Workers under democratic leaders did not significantly differ in their safety compliance or participation compared to other leadership styles. Laissez-faire leaders, who adopt a hands-off approach, had a positive connection with safety participation but not with safety compliance. In laissez-faire environments, workers tended to actively participate in safety-related activities. However, this style did not significantly encourage strict adherence to safety rules, indicating a potential gap in enforcing safety protocols under this leadership approach.

The result from this study underscores the complexity of the relationship between leadership styles and safety behaviour. While certain leadership styles show positive associations with specific safety aspects, the overall picture is intricate and multifaceted. Organizations in the oil and gas industry need to consider these nuances when implementing safety interventions. Leadership style like transformation and transaction can be employed in the industry when leaders want their workers safety behaviour to be boosted. Also, combination of two to three leadership styles can produce more synergic effect on the worker safety behaviour. A holistic approach that combines aspects of transformational, transactional, and democratic leadership might be essential to foster a safety-conscious environment where both compliance and active engagement are encouraged. The findings from this research provides insight on which leadership style (s) influences safety behaviour and outcome.These valuable insightscan help tailor leadership and safety programs within the industry.

4.3 Relationship between Leadership Style and Safety Outcome

The findings from the analysis of leadership styles and their impact on safety outcomes in the Nigerian oil and gas industry reveal a complex relationship between leadership approaches, accidents, and near misses. These results have significant implications for safety management practices within the industry. The study demonstrates that transformational leadership significantly reduces accidents. This indicates that leaders who inspire and motivate their teams create a safer work environment with fewer accidents. However, this leadership style does not substantially impact near misses, suggesting that while accidents are reduced, potential hazards might not be adequately detected before they escalate. This finding aligns with previous research highlighting the positive influence of transformational leadership on safety outcomes (Hofmann et al., 2003). In contrast, transactional leadership shows a different pattern. It increases the likelihood of both accidents and near misses. This suggests that leaders relying on rewards and punishments might inadvertently create an environment where safety protocols are not strictly followed, leading to more accidents and near misses. Similar observations have been made in studies in other industries, emphasizing the need for a balanced approach within transactional leadership styles (Clarke, 2012). Authoritarian leadership has a positive impact on accidents but a relatively weak effect on near misses. While accidents might occur more frequently under this leadership style, potential hazards might not be adequately identified before accidents happen. This indicates a potential lack of emphasis on preventive measures, which is crucial for overall safety management (Johnson, 2015). Democratic leadership, encouraging collaboration and participation, slightly enhances the detection and prevention of near misses. However, it has a negligible effect on accidents. This suggests that while democratic leaders create an environment where potential hazards are more likely to be identified, their influence might not be significant enough to prevent accidents. This finding contrasts with some previous studies, indicating that the impact of democratic leadership on safety outcomes can vary significant based on the specific context (Clarke, 2012).Laissez-faire leadership is associated with a higher likelihood of accidents, indicating a lack of active safety management under this approach. However, it has a negligible impact on near misses, implying that potential hazards might not be effectively identified and prevented. This aligns with previous research emphasizing the importance of active leadership in safety management (Zohar, 2010).

Comparing these findings with related studies in other industries, similar trends have been observed. Research in manufacturing and construction sectors has indicated that laissez-faire leadership can lead to a lack of safety vigilance and increased accidents (Hofmann et al., 2003). Additionally, studies have highlighted the importance of proactive safety measures, emphasizing the need for leaders to actively engage in safety management to prevent accidents and near misses (Barling et al., 2002).

The results emphasize the critical role of leadership styles in shaping safety outcomes in the Nigerian oil and gas industry. Transformational leadership stands out as a positive force in reducing accidents, highlighting the significance of inspirational and motivational leadership approaches. However, a comprehensive safety approach necessitates not only reducing accidents but also actively preventing potential hazards, emphasizing the need for a balanced leadership style that actively promotes both accident prevention and the detection of near misses.

5. Conclusion

In this study, we investigated leadership style in Nigeria's oil and gas sector, focusing on both onshore and offshore operations. Democratic and transformational leadership were identified as dominant styles, with transformational leadership significantly reducing accidents. Transactional leadership had a complex influence, increasing accidents but also promoting participation in safety activities. Authoritarian leadership had a minor positive effect on

accidents, while democratic leadership showed a slight positive association with near misses. Laissez-faire leadership hinted at a higher accident likelihood in less interventionist environments. These findings underscore the tangible impact of leadership styles on safety outcomes, emphasizing the need for nuanced approaches in organizational decision-making. This study, based on rigorous research, serves as a valuable resource for industry leaders, policymakers, and researchers, providing essential insights for enhancing safety practices in Nigeria's evolving oil and gas industry.

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