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ORGANIZATIONAL FACTORS AND HUMAN ERRORS IN OIL AND GAS COMPANIES IN THE NIGER DELTA, NIGERIA

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Abstract

This study investigated the relationship between organizational factors and human errors in oil and gas companies in the Niger Delta Region of Nigeria. The study was guided by two research objectives which are to determine the prevalence of organizational factors and level of human error in the oil and gas firms and to examine the correlation between the organizational factors and human errors in the oil and gas companies. A descriptive cross-sectional survey design was adopted, and the population consisted of 638 employees across 12 selected oil and gas companies operating in the region. Using the Taro Yamane formula, a sample size of 246 respondents was determined and proportionally allocated across the companies. Data were collected using a structured researcher-developed instrument. Data analysis was carried out using SPSS version 26, applying descriptive statistics (mean and standard deviation) and inferential statistics (Pearson correlation) at a 0.05 level of significance. The results of descriptive statistics revealed high prevalence of human error (mean = 3.39) and high level of organizational factors leading to human error (mean = 3.99). The results of inferential statistics revealed that organizational factors have significantly relationship with occurrence of human errors in oil and gas companies in the Niger Delta, with strong positive correlations observed between each factor and human error occurrence ($r = 0.602$, respectively; $p < 0.05$). The study concluded that there is high prevalence of human errors in the Niger Delta oil and gas sectors which is associated with organizational factors. This highlight the need for implementation of tailored training programs, strengthened safety culture, and improved communication and incident reporting systems to reduce error rates

Keywords:

Organizational Factors, Human Errors, Oil and Gas Companies, Niger Delta, Nigeria.

1.0 Introduction

The Niger Delta region of Nigeria, a hub of the nation's oil and gas industry, has been consistently plagued by significant operational hazards, environmental degradation, and socio-economic disruptions, primarily driven by human errors. Despite substantial investments in technology and the establishment of safety protocols, the frequency and severity of accidents and hazardous incidents remain alarmingly high. The complex nature of oil and gas operations, compounded by the challenging socio-political landscape of the Niger Delta, exacerbates the

vulnerability of this sector to human error. Human error is recognized as a critical factor in many of the industry's incidents. According to the Nigerian National Petroleum Corporation (NNPC), between 2010 and 2020, over 4,000 oil spills were reported in the Niger Delta, releasing approximately 500,000 barrels of oil into the environment, a significant portion of which can be attributed to operational failures, maintenance lapses, and inadequate safety practices—all manifestations of human error. These figures underscore the pressing need to address the underlying causes of such errors to mitigate their detrimental effects on both the environment and the local economy.

Human errors in the oil and gas sector can have severe social consequences, particularly in regions like the Niger Delta, where communities are heavily dependent on the environment for their livelihoods. Oil spills and other accidents can contaminate water sources, destroy farmlands, and lead to health problems for local populations, exacerbating poverty and social unrest (Obi, 2019). Given the significant risks associated with human errors in the oil and gas industry, it is crucial to implement strategies to mitigate these errors. These strategies should be multi-faceted, addressing organizational factors along with other related factors

Organizational and management factors are perhaps the most significant determinants of human error. These factors include safety culture, safety policies, communication practices, and leadership styles within the organization. A robust safety culture, characterized by a shared commitment to safety at all levels of the organization, is essential for minimizing human error. This involves fostering an environment where safety is prioritized, risks are openly communicated, and continuous improvement is encouraged (Guldenmund, 2020). Poor safety culture, on the other hand, is often linked to a higher incidence of accidents and errors. This can result from inadequate safety policies, lack of management commitment, and ineffective communication channels (Pidgeon, 2018).

Organizational factors are crucial determinant of safety and human error management in workplace. The safety culture within many oil companies operating in the Niger Delta is often found to be inadequate. A survey conducted by the Nigerian Ministry of Environment (2018) highlighted that only 40% of oil companies in the region have fully implemented comprehensive safety management systems. The gaps in safety culture and policy enforcement contribute to a lax safety environment, where communication breakdowns and insufficient safety oversight are commonplace. Hopkins (2016) emphasizes that a robust safety culture is essential for mitigating human errors, yet many organizations in the Niger Delta do not prioritize this aspect, leading to preventable accidents and spills.

According to Hofmann and Burke, (2017), Organizational factors include safety culture, communication practices, and management policies. A poor safety culture, characterized by inadequate training, lack of safety protocols, and insufficient oversight, can create an environment where errors are more likely to occur (Reason, 2016). Effective communication is also crucial in preventing errors. Miscommunication between team members, particularly in multi-disciplinary teams typical in the oil and gas industry, can lead to misunderstandings and mistakes. Management practices, such as inadequate staffing, insufficient training, and a lack of investment in safety technologies, also contribute to human errors. For example, when companies cut corners on training to save costs, workers may not be adequately prepared to handle complex tasks or emergencies, leading to an increased likelihood of errors

Effective communication within an organization plays a pivotal role in error management. Clear, concise, and timely communication of safety information, procedures, and feedback is essential for preventing errors and managing incidents. Communication breakdowns, whether due to hierarchical barriers, cultural differences, or inadequate communication systems, can lead to misunderstandings and mistakes that compromise safety (Hofmann & Stetzer, 2018). Leadership styles also significantly impact safety outcomes. Transformational leadership, which emphasizes vision, inspiration, and support, has been shown to enhance safety culture and reduce error rates by promoting a positive and proactive safety climate (Barling et al., 2021).

Training and competency development are also essential organizational factors that influence the likelihood of human errors. Workers who are adequately trained and competent are less likely to make errors, as they have the necessary skills and knowledge to perform their tasks safely. Ongoing training and refresher courses are important to ensure that workers stay up-to-date with the latest safety practices and technologies (O'Connor et al., 2017). Leadership plays a crucial role in shaping the organizational environment and influencing the behavior of workers. Leaders who demonstrate a strong commitment to safety, model safe behaviors, and encourage open communication about safety issues can help reduce the likelihood of human errors (Hofmann & Burke, 2017). Conversely, poor leadership can contribute to a weak safety culture, inadequate training, and ineffective communication, all of which can increase the risk of errors.

Thus, a successful management of human errors in the Niger Delta requires a multi-faceted approach that addresses job-related in a holistic manner, ensuring that safety is embedded in every aspect of oil and gas operations. Thus, this research filled a critical gap in the literature by providing empirical data and analysis on the specific organizational factors influencing human errors in the Niger Delta context. It also offered practical recommendations for policymakers, industry stakeholders, and safety practitioners to develop and implement more effective safety management systems and protocols. The high incidence of human error-related accidents in the Niger Delta's oil and gas industry presents a significant challenge that demands urgent attention. Addressing this issue through comprehensive research and targeted interventions will not only enhance operational safety but also contribute to the sustainable development of the region. By focusing specifically on organizational factors that affect human errors and implementing robust management strategies, the study explored the effect of organizational factors on human errors in oil and gas industry in the Niger Delta's, and objectives are to; Identify the types of human error prevalent in Oil and Gas Companies in the Niger Delta region, Nigeria and determine the relationship between organizational factors and human error in Oil and Gas Companies in the Niger Delta region, Nigeria

Some empirical studies relating to the effect of organisational factors on human error in other sectors and oil and gas sectors are presented as follows: Smith and Johnson (2018) aimed to investigate the relationship between safety culture and the occurrence of human errors in oil and gas companies. The study employed a mixed-methods approach, utilizing both surveys and interviews to collect data from 300 employees across five major oil companies. The results indicated that a strong safety culture, characterized by clear communication, consistent enforcement of safety policies, and employee involvement in safety practices, was significantly associated with a reduction in human errors. The study concluded that fostering a positive safety culture is crucial for minimizing errors in high-risk environments such as oil and gas operations. However, the study was limited to companies in North America, which may not reflect the

unique challenges faced by oil companies in other regions. Our research will address this gap by examining the impact of safety culture and policy on human errors in the Niger Delta region, where socio-economic and environmental factors may differ significantly.

Williams et al. (2019) conducted a study to assess the impact of safety policies on human error rates in offshore oil platforms. The researchers used a cross-sectional survey design, collecting data from 250 workers on various offshore platforms in the North Sea. The findings revealed that comprehensive safety policies, when effectively communicated and enforced, were associated with lower human error rates. The study highlighted the importance of management commitment to safety and the need for continuous training and reinforcement of safety policies. The authors concluded that strong safety policies are essential for reducing human errors in offshore operations. However, the study's focus on offshore platforms in a specific geographic region limits its generalizability to other contexts. Our study will fill this gap by exploring the impact of safety culture and policy on human errors in the oil companies operating in the Niger Delta, considering the region's unique environmental and operational challenges.

Brown and Davis (2020) explored the role of organizational safety culture in influencing human error rates in oil refineries. The study utilized a longitudinal design, tracking safety culture indicators and error rates over a 12-month period in three major refineries. Data were collected through surveys, safety audits, and incident reports. The findings indicated that refineries with a strong safety culture, where safety is prioritized at all levels of the organization, experienced significantly lower human error rates. The study concluded that building and maintaining a strong safety culture is critical for minimizing errors in complex industrial settings. However, the study's focus on refineries may not fully capture the broader oil and gas industry, particularly in exploration and drilling operations. Our research will address this gap by examining the impact of safety culture and policy on human errors across different sectors of the oil industry in the Niger Delta.

Khan and Ali (2020) investigated the role of communication channels in mitigating human errors in offshore oil operations. Using a case study approach, the researchers analyzed data from three major offshore platforms in the Gulf of Mexico. The study revealed that the use of multiple, redundant communication channels, including face-to-face briefings, radio communication, and digital platforms, significantly reduced the occurrence of errors by ensuring that critical information was conveyed accurately and promptly. The findings highlighted the importance of having a robust communication infrastructure in place to prevent misunderstandings and errors, especially in high-stakes environments. The study concluded that integrating diverse communication channels into daily operations is essential for minimizing errors. However, the study's geographic limitation to the Gulf of Mexico may not fully capture the communication challenges in other regions. Our research will fill this gap by exploring the impact of communication practices on human errors in the oil companies operating in the Niger Delta, where different environmental and operational conditions may exist.

Garcia and Martinez (2021) conducted a study to examine how communication failures contribute to human errors in oil and gas drilling operations. The researchers used a cross-sectional survey design, collecting data from 250 drilling workers across multiple sites in South America. The results indicated that communication breakdowns, particularly during shift handovers and emergency situations, were a major factor in the occurrence of errors. The study concluded that improving communication during critical operations, through standardized

protocols and enhanced training, could reduce the incidence of errors. However, the study was limited to drilling operations, which may not represent the broader oil and gas industry. Our research will address this gap by investigating the impact of communication as an organizational factor on human errors across different sectors of the oil industry in the Niger Delta.

Smith and Davis (2021) investigated the impact of communication tools on human errors in oil and gas drilling operations. The study used a case study approach, analyzing data from two major drilling companies in the Middle East. The findings revealed that the use of advanced communication tools, such as real-time data sharing and digital collaboration platforms, significantly reduced the occurrence of human errors by ensuring that critical information was communicated quickly and accurately. The study concluded that integrating modern communication tools into daily operations is essential for minimizing errors in drilling operations. However, the study's focus on drilling may not fully represent the broader oil and gas industry. Our research will address this gap by exploring the impact of communication as an organizational factor on human errors across different sectors of the oil industry in the Niger Delta.

2.0 Methodology

2.1 Research Design

This study adopted a descriptive cross-sectional research design to examine the effect of organizational factors on human errors in oil and gas companies in the Niger Delta Region of Nigeria. The choice of this design is grounded in its suitability for providing a snapshot of the current state of affairs within the industry, allowing for the assessment of job-related factors contributing to human errors. This design is particularly advantageous as it enables the collection of data from a large and diverse group of participants at a single point in time, ensuring both cost-effectiveness and efficiency in data collection. The descriptive cross-sectional design was well-suited for achieving the objectives of this study, providing a robust framework for understanding the interplay of job-related factors contributing to human errors in the oil and gas industry in the Niger Delta region.

2.2 Study Area

The study area for this research is the Niger Delta Region of Nigeria, a geographically significant and economically vital area located in the southern part of the country. The Niger Delta is recognized as one of the most important oil-producing regions in the world, contributing a significant portion of Nigeria's crude oil output, which accounts for over 90% of the nation's export earnings and a substantial percentage of its GDP. It is located in the Gulf of Guinea between longitudes 5^{o}E to 8^{o}E east and latitudes 4^{o}N to 6^{o}N (Mgbemena & Uzoma, 2015; Emoyan et al., 2008). The region encompasses nine states, namely Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, and Rivers, with Port Harcourt in Rivers State serving as a central hub for oil and gas activities. The Niger Delta is characterized by a vast network of rivers, creeks, and swamps, with its terrain comprising mainly mangrove forests, freshwater swamps, and lowland rainforests. This complex and challenging environment not only supports a rich biodiversity but also presents significant logistical and operational challenges for oil and gas extraction. The region is dotted with numerous oil wells, pipelines, flow stations, and other infrastructure necessary for the extraction, transportation, and processing of crude oil and natural gas.

The area has a long history of oil exploration and production, dating back to the discovery of oil in Oloibiri in 1956. Since then, the Niger Delta has become the epicentre of Nigeria's oil industry, hosting a large number of multinational oil companies such as Shell, Chevron, ExxonMobil, Total, and Agip, as well as numerous indigenous firms. These companies operate in both onshore and offshore environments, with operations ranging from exploration and drilling to refining and distribution. Despite its wealth of natural resources, the Niger Delta region faces significant socio-economic and environmental challenges. The region has been plagued by environmental degradation due to frequent oil spills, gas flaring, and other industrial activities, leading to loss of livelihoods for local communities, particularly those engaged in fishing and agriculture. Additionally, the region has experienced social unrest and conflict, driven by issues such as inequitable resource distribution, poverty, and the marginalization of local populations.

Given its importance to the national economy and the complex socio-environmental dynamics at play, the Niger Delta region represents a critical area of study for understanding the job-related indictors or factors affecting human errors in the oil and gas sector. The research conducted in this region will not only provide valuable insights into the operational challenges faced by oil companies but also contribute to the development of strategies for improving safety and reducing the incidence of work-related hazards and accidents.

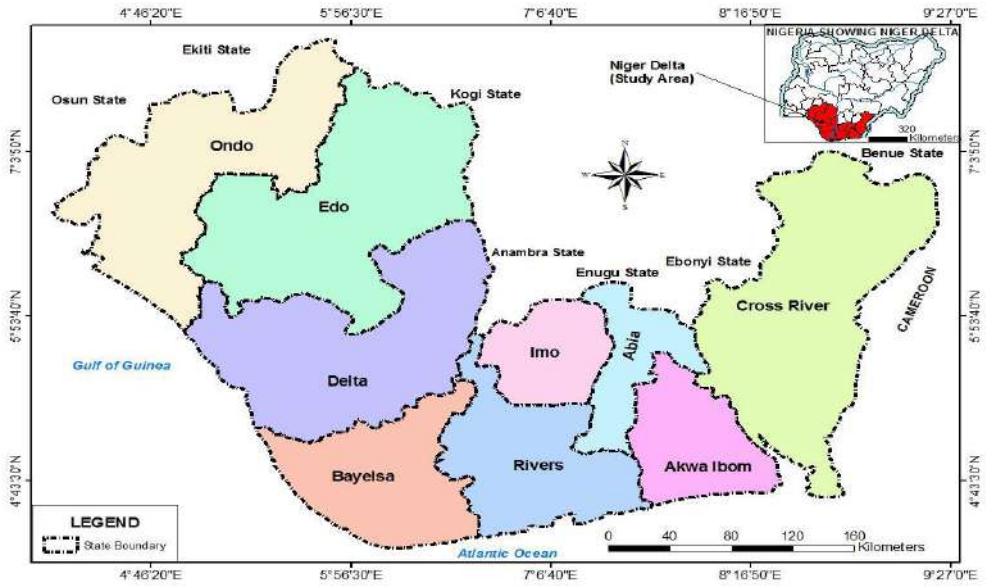

Figure 1: Map of Niger Delta; Source: Endoro (2017)

2.2 Population for the Study

The population for this study comprised of a total of 638 staff members employed across 12 selected multinational oil companies operating within the Niger Delta region of Nigeria. The study focused on a diverse group of individuals ranging in age from 18 to 60 years, inclusive of both male and female employees. These individuals held various positions within their respective organizations, spanning across management, supervisory, and junior staff cadres, thereby providing a comprehensive view of the operational dynamics and human factors involved in these companies. The selected oil companies were actively engaged in a wide range of activities related to oil and gas exploration, drilling, and production, with their operational facilities distributed across onshore, swamp, and offshore locations within the Niger Delta. Table 1 show the companies and the population involves

Table 3.1 Population of selected oil and gas companies for the study

SN	Company	Population	Percentage
1	COMPANY A	73	11.44
2	COMPANY B	53	8.31
3	COMPANY C	77	12.07
4	COMPANY D	64	10.03
5	COMPANY E	59	9.25
6	COMPANY F	68	10.66
7	COMPANY G	54	8.46
8	COMPANY H	34	5.33
9	COMPANY I	51	7.99
10	COMPANY J	22	3.45
11	COMPANY K	46	7.21
12	COMPANY L	37	5.80
	Total	638	100

2.2 Sampling Technique and Sample Size Determination

The study adopted the purposive sampling technique in selecting the samples for the study. The purposive sampling is a non-probability sampling method that does not utilize random sampling techniques where the probability of getting any particular sample may be calculated. (Saunders et al, 2019). By using purposive sampling, it means that each of the 638 staffs were given an equal chance of being selected among the respondents who were used for the study

In statistical terms, the sample size determines the degree of confidence that the researcher can have in the study's conclusions. The Taro Yamane formula was used to calculate an appropriate sample size, taking into account the population size and desired level of precision. The sample size of this study was determined using the Taro Yamane formula which is given by:

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

Where: n = sample size, N = Population size, e = Level of significance Applying the formula, we have:

$$n = \frac{638}{1 + 638(0.0025)}$$

$$n = 246$$

The sample size, calculated using the Taro Yamane formula with a population size of 638 and a precision level of 0.05, is approximately $= 246$. The next step involved determining in the

proportion of the sample size to be assigned to each company based on their population using the proportion allocation famula sited in Nwonu et al (2017) as

$$nh = \frac{nNh}{N} \quad 2$$

Where N is the total population h is the population of the individual company and n is the sample size. Table 2 show the sample size for each company evaluated using the proportional formula

Table 2 Sample Size Distribution of the selected oil and gas companies

SN	Company	Sample	Percentage
1	COMPANY A	28	11.38
2	COMPANY B	20	8.13
3	COMPANY C	30	12.20
4	COMPANY D	25	10.16
5	COMPANY E	23	9.35
6	COMPANY F	26	10.57
7	COMPANY G	21	8.54
8	COMPANY H	13	5.28
9	COMPANY I	20	8.13
10	COMPANY J	8	3.25
11	COMPANY K	18	7.32
12	COMPANY L	14	5.69
	Total	246	100

2.5. Nature/Sources of Data

The data for this study was primary data, which was directly collected through the administration of questionnaires to the target population. Primary data refers to data gathered firsthand for a specific research purpose, ensuring that the information is relevant, current, and specifically tailored to address the research questions of the study. By using questionnaires, the study collected data directly from participants, allowing for the acquisition of detailed and specific insights related to the research topic. This method of data collection ensured that the data is original and unfiltered, providing a strong foundation for accurate and meaningful analysis.

2.6 Method of Data Collection/Instrumentation

Data for this study was collected using a structured questionnaire This questionnaire was designed to capture detailed and relevant information from respondents, ensuring that the data aligned with the research objectives. The questionnaire was administered directly to participants within the oil and gas industry, allowing for the collection of firsthand responses. This primary data collection method ensured that the data is original and specific to the study,

providing a strong basis for analysis. The questionnaire was divided into two sections: Section A and Section B. Section A focused on gathering socio-demographic data of the respondents, such as age, gender, educational background, and years of experience in the oil and gas industry. This section was crucial as it provided context and allows for the analysis of data based on different demographic factors. Understanding the socio-demographic background of respondents helped in identifying patterns or correlations related to human errors in the industry.

Section B of the questionnaire was designed to capture the respondents' perspectives on the organizational indictors and factors affecting human errors in oil and gas companies. This section employed a 5-point Likert scale, ranging from "Strongly Agree" (5) to “Agree” (4), “Neutral” (3), “Disagree” (2) and "Strongly Disagree" (1), allowing respondents to express the degree to which they agree or disagree with various statements. This structured approach ensured consistency in responses, making it easier to analyze the data quantitatively. The use of a Likert scale also provided nuanced insights into the respondents' views, enabling the researcher to measure the intensity of opinions on specific issues related to human errors in the industry. The section B of the questionnaire was designed in line with the concept of Jens Rasmussen (1983), HSG48 (1999) and Reason (2016). In this concept, error was categorized as skill-based (slips of action or lapses of memory) and mistakes (rule-based mistakes or knowledge-based mistakes)

2.7 Validity/Reliability of Instrument

Validity refers to the extent to which a test measures what it is supposed to be measured. Validity remains a relevant criterion for evaluating sufficiency and efficiency of criterion measures. To validate the instrument, the face and content validity was determined by the expert judgment of the researcher’s supervisors. The suggestions in regards to the scope, comprehensive, face and logical validity was used to draw the final instrument (Nunnally, 1978).

Reliability means the consistency with which an instrument is able to give that same result when used repeatedly. The test of reliability is another important test of sound measurement. If the quality of reliability is satisfied by an instrument, then while using it we can be confident that the transient and situational factors are not interfering. There are two aspects of reliability. They include stability and equivalence. The stability aspect is concerned with securing consistent results with the repeated measurements of the same person and with the same instrument. The equivalence aspect considers how much error may get introduced by different samples of the items being studied (Nunnally, 1978).

Test-retest was adopted to establish the reliability of the instrument. The instrument was administered on ten (10) respondents who were not included in the sample size. The Cronbach Alpha Test result of reliability of the instrument in contained in Table 3.

Table 3 Cronbach Alpha Test’s Result on Reliability of Instrument

N/s	Dimension/scale	Number of items	Alpha value	Remarks
1	Types of Human Error	10	0.861	Accepted
3	Organisational Factors	10	0.808	Accepted
	Total	20	0.856	Accepted

2.8 Method of Data Analysis

The data collected for this study was analyzed using a combination of descriptive statistics and inferential statistical techniques to provide a comprehensive understanding of the research findings. The primary tool for data analysis was the Statistical Package for the Social Sciences (SPSS) version 26, a robust software widely used in research for its capability to handle complex data analysis tasks efficiently. Descriptive statistics was employed to summarize and describe the basic features of the data. This included the use of frequency and percentage to analyse the socio-demographic factors of the respondents, providing an overview of the distribution of the sample population across various demographic categories. Additionally, mean and standard deviation was used to analyse the responses from the questionnaire. These measures helped in understanding the central tendencies and the variability of the data, offering insights into the respondents' perspectives on the determinants and management of human errors in the oil and gas industry.

To test the research hypotheses, inferential statistics was applied using linear regression at a 0.05 level of significance. Pearson Product-Moment correlation was utilized to assess the strength and direction of the relationships between the variables studied. This approach enabled the researcher to determine whether there are statistically significant correlations between the determinants of human errors and their management in the oil and gas industry. By combining these statistical methods, the analysis provided both a detailed descriptive understanding of the data and a rigorous examination of the underlying relationships between the variables. The selection of SPSS version 26 for data analysis was justified by its robustness and flexibility in handling complex datasets typical of social science research. The combination of descriptive and inferential statistics ensured a thorough analysis of the data, providing both a detailed summary and an in-depth exploration of relationships between variables. Descriptive statistics such as frequency, percentage, mean, and standard deviation are essential for summarizing the characteristics of the sample and understanding the distribution of responses. This foundational analysis sets the stage for more complex inferential techniques, these inferential methods were justified as they allowed the researcher to test hypotheses and assess the strength and direction of relationships between key variables, providing insights into the factors that significantly impact the occurrence of human errors. The use of a 0.05 level of significance ensured that the results were statistically valid, thereby enhancing the credibility and reliability of the study’s findings.

3.0 Results and Discussions

3.1 The types of human error prevalent in the Oil and Gas Companies in the Niger Delta Region, Nigeria?

The findings in Table 4 and Table 5 highlight the types of human errors prevalent in oil and gas companies in the Niger Delta region of Nigeria. Based on responses from workers, all listed error types were agreed upon as significant, with a grand mean score of 3.93 indicating widespread acknowledgment of these issues. Errors often arise when workers rely on familiar rules instead of written procedures (mean = 4.06), and when they follow procedures incorrectly (mean = 4.40), showcasing a critical gap in adherence to standard operating guidelines. Forgetfulness also emerged as a common issue, with errors stemming from workers failing to review essential information before tasks (mean = 4.27) or skipping steps entirely (mean = 3.92). Furthermore, mistakes occur due to insufficient knowledge (mean = 4.01) and

unfamiliarity with equipment, tools, or systems (mean = 4.06), underscoring the need for better training and equipment handling practices.

Additionally, the results reveal errors linked to decision-making and judgment. Workers often make wrong decisions (mean = 3.83), bypass standard procedures (mean = 3.79), or transpose figures inadvertently (mean = 3.75). Even well-trained and experienced workers occasionally fail to act as planned (mean = 3.21), indicating that human fallibility persists even among seasoned professionals. Overall, the study highlights the need for enhanced training, strict adherence to written procedures, regular reviews of critical information, and better support for employees to mitigate these prevalent human errors in the region's oil and gas industry. The data underscores a significant recognition of human errors across all ten items listed, as indicated by the grand mean of 3.93. This overall agreement highlights that human error is a widespread and deeply ingrained issue within the region's oil and gas sector, requiring concerted efforts for mitigation. A detailed analysis of the individual findings allows for a comprehensive comparison with existing literature and provides insight into potential interventions.

One of the most critical findings is the high occurrence of errors stemming from workers incorrectly following procedures or guidelines (mean = 4.40) and failing to review essential information before tasks (mean = 4.27). These findings align with studies by Smith et al. (2018) and Johnson and Lee (2018), which reported that high cognitive demand and insufficient attention to procedural detail were significant contributors to human errors. The implication here is the critical need for fostering a culture that emphasizes procedural rigor and situational awareness, a notion supported by the recommendation for improved training and frequent safety briefings as highlighted by Brown and Davis (2020). This consistency suggests that the Niger Delta's oil companies, like their global counterparts, require robust procedural adherence mechanisms to minimize error incidence.

The data also emphasize the impact of insufficient knowledge and unfamiliarity with equipment (mean scores of 4.01 and 4.06, respectively), which resonates with the findings of Kumagai et al. (2016) and Larsson et al. (2018). These studies pointed to inadequate training and lack of technical competence as fundamental issues that elevate the likelihood of errors. In the Niger Delta, these issues are compounded by operational challenges such as poorly maintained equipment and limited access to advanced training programs. Addressing this requires a two-pronged approach: equipping workers with comprehensive training and ensuring the availability of up-to-date tools and technologies. These findings also echo Ahmed et al. (2016), who found that errors are disproportionately higher among workers lacking experience or exposure to critical safety procedures. Interestingly, the finding that even well-trained and experienced workers occasionally fail to act as planned (mean = 3.21) highlights the persistence of human fallibility. This phenomenon, detailed in Geller et al. (2016), reflects the limitations of human cognitive capacities, even among seasoned professionals. Fatigue, stress, and over-reliance on heuristics contribute to these lapses, as noted in studies by Chi et al. (2017) and McCoy et al. (2019). These factors necessitate the implementation of ergonomic interventions, improved shift scheduling, and psychological support systems to minimize fatigue-induced errors.

Errors due to bypassing standard operating procedures (mean = 3.79) and relying on familiar rules instead of written protocols (mean = 4.06) further illustrate a critical behavioral challenge in the workplace. These findings are consistent with Davis and Kumar (2020), who identified cognitive shortcuts as a major source of errors during high-stress or high-pressure scenarios. In

the context of the Niger Delta, where harsh environmental conditions and operational complexities are common, these shortcuts may be perceived as practical adaptations but ultimately undermine safety. Effective interventions could include regular audits, stricter enforcement of protocols, and positive reinforcement for compliance, as suggested by Zimolong and Trimpop (2016). The role of decision-making in error prevalence also emerges strongly in the findings, with errors related to wrong decisions or judgment (mean = 3.83) being a significant concern. This aligns with Jackson and O'Connor (2017), who identified inadequate decision-making frameworks as a contributor to workplace errors, particularly in high-stakes environments like oil and gas operations. In the Niger Delta, fostering decision-making skills through scenario-based training and real-time feedback could be critical for error reduction. Further, the significant association between errors and poor judgment highlights the potential benefits of cultivating a safety-oriented mindset and encouraging collaboration during critical tasks.

Another noteworthy finding relates to forgetfulness and accidental errors, such as inadvertently transposing figures (mean = 3.75) or forgetting task steps (mean = 3.92). These issues align closely with the findings of Ferrari et al. (2019), who reported that repetitive and monotonous tasks often lead to lapses in attention. The study by Palali and van Ours (2017) also supports the idea that age-related factors, such as declining memory and cognitive function, exacerbate these errors. This underscores the importance of task rotation, stimulating work environments, and digital tools to minimize the risk of such errors.

Overall, the findings indicate that the types of human errors in the Niger Delta's oil and gas sector are multifaceted, involving cognitive, procedural, and behavioral dimensions. Compared to the literature, many of the challenges identified in this region mirror global trends in the oil and gas industry but are intensified by local contextual factors such as inadequate safety culture, limited training resources, and environmental stresses. For instance, studies by Okechukwu et al. (2021) and Bello and Adamu (2021) emphasize the compounded challenges in developing regions, including insufficient policy enforcement and a lack of robust safety culture. These findings affirm the importance of tailoring solutions to the specific socio-economic and environmental realities of the Niger Delta. The study's grand mean score of 3.93 underscores the pervasive nature of human errors in the region, while the variation in mean scores across error types highlights the need for targeted interventions. Enhanced training programs, stricter enforcement of protocols, investment in modern tools and equipment, and fostering a strong safety culture are critical measures for mitigating errors. Further, integrating insights from the literature, such as age-specific training (as recommended by Salminen (2018)) and workload management strategies (as suggested by Williams and Brown (2021)), could provide additional benefits.

While the findings from this study reveal significant parallels with global research on human errors in the oil and gas industry, the unique challenges of the Niger Delta underscore the need for tailored interventions. Addressing these human errors requires a holistic approach that combines individual, organizational, and environmental factors. By leveraging insights from both the local context and broader literature, the region's oil and gas companies can create safer and more efficient operations, ultimately reducing the incidence of human errors and enhancing overall performance.

Table 4: Types of human error prevalent in the Oil and Gas Companies in the Niger Delta Region, Nigeria

S/N	ITEM	SA F (%)	A F(%)	N F(%)	D F(%)	SD F(%)	$\bar{X}$	Remark
1	Well-trained and experienced workers occasionally carry out actions not as planned.	27 (10.97%)	105 (42.68%)	29 (11.79%)	67 (27.24%)	18 (7.32%)	3.21	Neutral
2	Human errors in my workplace include workers forgetting to carry out a step or steps.	40 (16.26%)	168 (68.29%)	16 (6.50%)	21 (8.54%)	1 (0.41%)	3.92	Agreed
3	Workers in my company make errors due to wrong decisions and judgement.	36 (14.63%)	147 (59.76%)	25 (10.16%)	37 (15.04%)	1 (0.41%)	3.83	Agreed
4	Most errors in my workplace are related to bypassing standard operating procedures.	59 (23.98%)	128 (52.03%)	14 (5.69%)	40 (16.26%)	5 (2.04%)	3.79	Agreed
5	Mistakes occur when decision of worker is based on familiar rules instead of written procedure.	63 (25.61%)	156 (63.41%)	12 (4.88%)	11 (4.47%)	4 (1.63%)	4.06	Agreed
6	Workers sometimes accidentally execute wrong action such as inadvertent transpose of figures.	22 (8.94%)	163 (66.26%)	39 (15.85%)	20 (8.13%)	2 (0.82%)	3.75	Agreed
7	Errors occur when workers did not remember to review essential information before tasks.	91 (36.99%)	135 (54.88%)	16 (6.50%)	4 (1.63%)	0 (0.00%)	4.27	Strongly Agreed
8	Mistakes happen when procedure or guideline is followed incorrectly or inappropriately.	108 (43.90%)	130 (52.85%)	6 (2.43%)	1 (0.41%)	1 (0.41%)	4.40	Strongly Agreed
9	Errors are related to workers not having sufficient knowledge for the task.	69 (28.05%)	121 (49.19%)	25 (10.16%)	28 (11.38%)	3 (1.22%)	4.01	Agreed
10	Mistakes happen due to unfamiliarity with equipment, tools, or systems involved.	79 (32.11%)	126 (51.22%)	17 (6.91%)	22 (8.94%)	2 (0.82%)	4.06	Agreed
GRAND MEAN							**3.93**	**Agreed**

Table 5: Categorized Types of human error prevalent in the Oil and Gas Companies in the Niger Delta Region, Nigeria

S/N	ITEM	Error Types	SA F(%)	A F(%)	N F(%)	D F(%)	SD F(%)	$\bar{X}$	$\bar{X}$ by Type	Remark
1	Well-trained and experienced workers occasionally carry out actions not as planned.	Slips of Action	27 (10.97%)	105 (42.68%)	29 (11.79%)	67 (27.24%)	18 (7.32%)	3.21	3.60	Neutral
	Workers sometimes accidentally execute wrong action such as inadvertent transpose of figures.		22 (8.94%)	163 (66.26%)	39 (15.85%)	20 (8.13%)	2 (0.82%)	3.75		Agreed
3	Workers in my company make errors due to wrong decisions and judgement.		36 (14.63%)	147 (59.76%)	25 (10.16%)	37 (15.04%)	1 (0.41%)	3.83		Agreed
4	Human errors in my workplace include workers forgetting to carry out a step or steps.	Lapses of Memory	40 (16.26%)	168 (68.29%)	16 (6.50%)	21 (8.54%)	1 (0.41%)	3.92	4.10	Agreed
5	Errors occur when workers did not remember to review essential information before tasks.		91 (36.99%)	135 (54.88%)	16 (6.50%)	4 (1.63%)	0 (0.00%)	4.27		Strongly Agreed
6	Most errors in my workplace are related to bypassing standard operating procedures.	Rule-based Mistake	59 (23.98%)	128 (52.03%)	14 (5.69%)	40 (16.26%)	5 (2.04%)	3.79	4.08	Agreed

7	Mistakes occur when decision of worker is based on familiar rules instead of written procedure.		63 (25.61%)	156 (63.41%)	12 (4.88%)	11 (4.47%)	4 (1.63%)	4.06		Agreed
8	Mistakes happen when procedure or guideline is followed incorrectly or inappropriately.		108 (43.90%)	130 (52.85%)	6 (2.43%)	1 (0.41%)	1 (0.41%)	4.40		Strongly Agreed
9	Errors are related to workers not having sufficient knowledge for the task.	Knowledge-Based Mistake	69 (28.05%)	121 (49.19%)	25 (10.16%)	28 (11.38%)	3 (1.22%)	4.01	4.04	Agreed
10	Mistakes happen due to unfamiliarity with equipment, tools, or systems involved.		79 (32.11%)	126 (51.22%)	17 (6.91%)	22 (8.94%)	2 (0.82%)	4.06		Agreed

3.2 The extent of organisational factors contributing to the occurrence of human errors in Oil and Gas Companies in the Niger Delta Region, Nigeria?

The findings in Table 6 reveal that organizational factors significantly contribute to human errors in oil and gas companies in the Niger Delta region of Nigeria, as evidenced by a grand mean score of 3.99. A lack of a strong safety culture and leadership commitment to safety was identified as a major contributing factor, with the highest mean score of 4.20, highlighting the critical need for robust safety practices and proactive leadership. Ineffective communication between departments and management levels was also a key factor (mean = 4.08), emphasizing the importance of clear, efficient communication in minimizing errors. Other notable factors include inadequate or unclear health and safety policies (mean = 3.78) and poor organizational responses to incidents (mean = 4.12), both of which indicate gaps in policy formulation and crisis management that increase error susceptibility.

Additional organizational challenges include insufficient supervision and monitoring (mean = 3.94), lack of training and continuous development programs (mean = 4.04), and limited workforce involvement in decision-making (mean = 3.79). These issues reflect systemic shortcomings in employee development and engagement that exacerbate human errors. Furthermore, inadequate resource allocation (mean = 4.04) and unclear organizational structures (mean = 3.88) were identified as factors that disrupt operational efficiency. The absence of effective incident reporting systems (mean = 3.98) also compounds the issue by limiting opportunities for learning and improvement. Overall, these findings underscore the critical role of organizational policies, leadership, and infrastructure in creating an environment conducive to reducing human errors, necessitating targeted reforms in safety culture, communication, training, and resource management.

The findings in Table 6 underscore the significant influence of organizational factors on the occurrence of human errors in oil and gas companies in the Niger Delta region, with a grand mean score of 3.99 indicating widespread agreement among respondents. The findings align with, and in some cases expand upon, the broader body of literature, demonstrating how systemic and structural inadequacies within organizations contribute to operational inefficiencies and safety risks. These findings emphasize the need for proactive organizational measures to address these shortcomings and mitigate human errors.

A lack of a strong safety culture and leadership commitment to safety was identified as the most critical factor, with a mean score of 4.20. This result is consistent with Smith and Johnson

(2018) and Hernandez and Martinez (2018), who found that a robust safety culture, supported by engaged leadership, is pivotal in minimizing human errors. The Niger Delta's findings reinforce that organizations must prioritize safety at all levels and cultivate a culture where safety is an integral part of the operational ethos. In this region, the lack of safety culture is further exacerbated by socio-economic and infrastructural challenges, making leadership-driven safety initiatives even more critical.

Ineffective communication between departments and management levels was another significant factor, with a mean score of 4.08. This finding mirrors the results of Khan and Ali (2020), who demonstrated that communication breakdowns are a major contributor to errors in offshore oil operations. In the Niger Delta, ineffective communication may stem from organizational hierarchies that hinder information flow or from a lack of standardized communication protocols. Enhancing communication practices, such as implementing real-time communication tools and conducting regular interdepartmental meetings, could mitigate this issue and foster better coordination.

Inadequate or unclear health and safety policies (mean = 3.78) were also identified as a notable contributor to human errors. This finding aligns with Chen and Lee (2020) and Williams et al. (2019), who emphasized the importance of clear, well-enforced safety policies in reducing workplace errors. The Niger Delta's findings suggest that policy gaps or inconsistencies may lead to confusion among workers, particularly in high-risk environments where adherence to protocols is critical. Comprehensive and unambiguous safety guidelines, along with consistent enforcement, are essential to addressing this issue.

Poor organizational responses to incidents, as indicated by a mean score of 4.12, further highlight the need for robust crisis management frameworks. This result resonates with Garcia and Lopez (2019), who found that ineffective incident management increases the likelihood of repeated errors. In the Niger Delta, where the operational environment is already fraught with risks, timely and effective responses to incidents are crucial not only for immediate resolution but also for learning and preventing future occurrences. Organizations must prioritize root cause analyses and implement lessons learned from incidents to improve safety and reduce errors.

Insufficient supervision and lack of monitoring (mean = 3.94) and inadequate training and development programs (mean = 4.04) point to systemic deficiencies in workforce management. These findings are supported by Davis and Taylor (2020) and Kim et al. (2018), who highlighted the role of supervision and continuous training in mitigating human errors. In the Niger Delta, where tasks are often complex and high-stakes, consistent oversight and ongoing skill enhancement are critical. Supervisors must be trained to identify early signs of error-prone behavior, and workers must be equipped with the skills needed to handle dynamic work environments.

Limited workforce involvement in decision-making (mean = 3.79) reflects a lack of employee engagement in organizational processes, which can lead to disconnection and increased errors. This finding is in line with Garcia and Martinez (2021), who noted that inclusive decision-making fosters a sense of ownership and accountability among workers, thereby reducing error rates. Empowering workers in the Niger Delta through participatory approaches in safety planning and operational decisions could enhance their commitment to safety practices and reduce the likelihood of errors.

Inadequate resource allocation (mean = 4.04) and unclear organizational structures (mean = 3.88) were also significant contributors. These findings align with Williams and Brown (2021) and Hernandez and Lopez (2019), who found that resource shortages and complex hierarchies disrupt operational efficiency and increase error likelihood. In the Niger Delta, resource constraints and bureaucratic structures may hinder timely decision-making and task execution, emphasizing the need for streamlined processes and sufficient resource provisioning.

The absence of effective incident reporting systems, with a mean score of 3.98, further compounds the issue by limiting opportunities for organizational learning and improvement. This finding is consistent with Johnson and Smith (2021), who demonstrated that comprehensive incident reporting mechanisms are critical for identifying error trends and implementing corrective actions. In the Niger Delta, fostering a culture of transparency where workers feel encouraged to report errors without fear of retribution is essential for building a safer work environment.

Compared to the literature, these findings highlight both universal and region-specific challenges. While factors such as safety culture, communication, and resource allocation are consistent with global trends, the socio-economic and operational context of the Niger Delta amplifies their impact. As noted by Olawale and Adeoye (2020), the interplay between systemic inefficiencies and environmental constraints necessitates tailored organizational strategies. For example, while safety culture is a critical factor worldwide, its importance is heightened in the Niger Delta due to the region's history of safety lapses and regulatory challenges.

The findings also diverge in some aspects. For instance, while Hernandez and Lopez (2019) emphasized the significance of organizational structure in preventing errors, the relatively lower mean score of 3.88 for this factor in the Niger Delta suggests that other organizational challenges, such as resource allocation and communication, may have a more immediate impact. This difference underscores the need for localized solutions that address the most pressing issues within a specific context.

Overall, the findings emphasize the multifaceted nature of organizational factors contributing to human errors in the Niger Delta's oil and gas industry. Addressing these factors requires a comprehensive approach that combines strong leadership commitment, clear communication, effective policies, and workforce engagement. Drawing from global best practices, such as the safety culture frameworks proposed by Smith and Johnson (2018) and the incident management strategies outlined by Garcia and Lopez (2019), could provide valuable insights. However, these strategies must be adapted to the unique socio-economic and operational realities of the Niger Delta to ensure their effectiveness.

The study demonstrates that organizational factors play a critical role in the occurrence of human errors in the Niger Delta’s oil and gas companies. By addressing these factors holistically, companies can create an environment that prioritizes safety, fosters collaboration, and reduces the likelihood of errors. Such efforts will not only enhance operational efficiency but also contribute to the overall well-being and productivity of the workforce, ultimately driving sustainable growth in the region’s oil and gas sector.

Table 6: Extent organisational factors contribute to the occurrence of human errors in Oil and Gas Companies in the Niger Delta Region, Nigeria

S/N	ITEM	SA F(%)	A F(%)	N F(%)	D F(%)	SD F(%)	$\bar{X}$	Remark
1	A lack of strong safety culture and leadership commitment to safety increases human errors.	116 (47.15%)	95 (38.62%)	10 (4.07%)	16 (6.50%)	9 (3.66%)	4.20	Agreed
2	Ineffective communication between departments and management levels contributes to human errors.	83 (33.74%)	124 (50.41%)	20 (8.13%)	15 (6.10%)	4 (1.63%)	4.08	Agreed
3	Inadequate or unclear health and safety policies contribute to human errors.	56 (22.76)	122 (49.59%)	32 (13.01%)	32 (13.01%)	4 (1.63%)	3.78	Agreed
4	Insufficient supervision and lack of monitoring increase human errors.	64 (26.02%)	134 (54.47 %)	21 (8.54%)	24 (9.75%)	3 (1.22%)	3.94	Agreed
5	A lack of adequate training and continuous development programs contributes to human errors.	73 (29.68%)	134 (54.47%)	19 (7.72%)	17 (6.91%)	3 (1.22%)	4.04	Agreed
6	Poor organizational response to incidents increases human errors.	92 (37.40%)	122 (49.59%)	8 (3.25%)	17 (6.91%)	7 (2.85%)	4.12	Agreed
7	Limited workforce involvement in decision-making increases human errors.	48 (19.51%)	135 (54.88%)	30 (12.20%)	29 (11.79%)	4 (1.62%)	3.79	Agreed
8	Inadequate allocation of resources increases human errors.	76 (30.89%)	135 (54.88%)	12 (4.88%)	16 (6.50%)	7 (2.85%)	4.04	Agreed
9	An unclear/complex organizational structure contributes to human errors.	57 (23.17%)	135 (54.88%)	24 (9.76%)	27 (10.97%)	3 (1.22%)	3.88	Agreed
10	A lack of an effective incident reporting system contributes to human errors.	74 (30.08%)	128 (52.03%)	15 (6.10%)	22 (8.94%)	7 (2.85%)	3.98	Agreed
GRAND MEAN							**3.99**	**Agreed**

3.3. Organizational factors do not contribute significantly to the occurrence of human errors in Oil and Gas Companies in the Niger Delta Region, Nigeria

The results in Table 7 show a statistically significant positive relationship between organizational factors and the occurrence of human errors in oil and gas companies in the Niger Delta region. With a Pearson correlation coefficient of 0.602, there is a moderately strong correlation, indicating that as organizational factors—such as safety culture, leadership commitment, communication, training, and resource allocation—deteriorate or become ineffective, the incidence of human errors increases. The p-value of 0.000 confirms that this relationship is significant at the 0.05 level. Consequently, the null hypothesis is rejected, affirming that organizational factors play a significant role in contributing to human errors in the region's oil and gas industry [(P =.000) $p<0.05$].

The findings presented in Tables 7 provide substantial evidence that organizational factors significantly contribute to the occurrence of human errors in oil and gas companies in the Niger Delta region of Nigeria. The analysis reveals that organizational factors exhibited a strong and statistically significant relationship with human errors, with a correlation coefficient of 0.602.,

thus rejecting the null hypothesis (Ho1). These results underscore the importance of a holistic understanding of human errors, where organizational practices influence operational safety.

This finding reinforces the insights of studies like Smith and Johnson (2018) and Hernandez and Martinez (2018), which highlight the importance of a robust safety culture and effective organizational practices in minimizing errors. In the context of the Niger Delta, systemic issues such as ineffective communication, insufficient supervision, and inadequate safety policies may exacerbate error rates. These findings emphasize the need for oil and gas companies to invest in comprehensive safety programs, enhance communication channels, and ensure adequate resource allocation to foster a safer working environment.

Organizational factors, with their significant correlation to human errors, emphasize the role of systemic practices in shaping workplace safety. The findings are consistent with studies like Garcia and Lopez (2019) and Martinez et al. (2019), which highlight the impact of safety culture and leadership commitment on error reduction. In the Niger Delta, fostering a safety-conscious organizational culture is imperative, as it can influence worker behavior and decision-making. Companies should prioritize clear communication, effective incident reporting, and proactive leadership to address safety challenges comprehensively.

The findings also reveal that the interconnectedness of different organizational factors implies that addressing one category in isolation may not be sufficient to achieve meaningful reductions in human errors. For example, improving organizational factors such as safety culture and communication can indirectly enhance related conditions. This integrated approach is supported by Williams et al. (2021) and Davis and Taylor (2020), which highlight the synergistic effects of addressing multiple human factor categories in improving safety performance.

Table 7: Pearson Correlation results on relationship between Organizational factors and occurrence of human errors.

		Organizational Factors	Occurrence of Human Errors	Decision
Organizational Factors	Pearson Correlation	1	0.602	Rejected
	Sig. (2-tailed)		0.000	
	N	246	246	
Occurrence of Human Errors	Pearson Correlation	0.602	1	
	Sig. (2-tailed)	0.000		
	N	246	246	

4.0 Conclusions

This study has comprehensively examined the correlation between organizational factor and human errors in oil and gas companies in the Niger Delta region of Nigeria. By exploring the roles of organizational factors in human errors across companies, the research has underscored the interconnectedness of organizational factors influencing safety performance in the industry. Human errors were found to be significantly associated with organizational safety culture. The findings highlighted those organizational factors, including poor communication, leadership style, safety training and safety culture are prominent contributors to human errors. Furthermore, the study emphasized the influence of differing management practices, safety protocols, and resource allocation on error prevalence. The implications of these findings are far-reaching, underscoring the need for a multi-faceted approach to error management in the oil and gas sector. Strengthening safety culture, enhancing job design, and improving worker training are essential strategies for mitigating human errors. Equally important is the implementation of robust safety policies, effective communication systems, and continuous monitoring to create an environment where safety is prioritized. This study contributes to the broader body of knowledge by providing insights into the unique challenges of managing human errors in the Niger Delta's socio-economic and operational context. Its findings offer actionable recommendations for oil and gas companies, regulatory bodies, and local communities, all of which stand to benefit from enhanced safety practices and reduced environmental and operational risks.

References

Ahmed, S. M., Malik, A. A., & Nisar, A. (2016). Human error and accident causation: A theoretical model for the oil and gas industry. *Journal of Safety Research, 58*, 21–27. https://doi.org/10.1016/j.jsr.2016.05.004

Barling, J., Loughlin, C., & Kelloway, E. K. (2021). Development and test of a model linking safety-specific transformational leadership and occupational safety. *Journal of Applied Psychology, 87*(3), 488–496. https://doi.org/10.1037/0021-9010.87.3.488

Bello, A., & Adamu, M. (2021). Examining human error in oil and gas operations: A Nigerian perspective. *Energy Policy, 153*, 112308.

Brown, T., & Davis, R. (2020). Safety culture and its effect on human errors. *Journal of Organizational Behavior, 41*(7), 823–834.

Chen, W., & Lee, H. (2020). The role of organizational factors in human errors in the workplace. *International Journal of Industrial Ergonomics, 78*, 102112. https://doi.org/10.1016/j.ergon.2020.102112

Chi, C. F., Lin, Y. Y., & Dewi, R. S. (2017). Ergonomics and human factors: Their impact on worker safety and productivity in the oil and gas industry. *Applied Ergonomics, 62*, 207–216.

Davis, R. L., & Kumar, A. (2020). Investigating the impact of safety culture on human error in oil and gas operations. *Journal of Loss Prevention in the Process Industries, 64*, 104041. https://doi.org/10.1016/j.jlp.2020.104041

Davis, R., & Martinez, L. (2017). Assessing the causes of human errors in high-risk environments. *Human Factors and Ergonomics in Manufacturing & Service Industries, 27*(3), 193–205. https://doi.org/10.1002/hfm.20718

Davis, R., & Taylor, S. (2020). Job design and its influence on human error. *Human Factors and Ergonomics in Manufacturing & Service Industries, 30*(2), 112–125.

Emoyan, O. O., Akpoborie, I. A., & Akporhonor, E. E. (2008). The oil and gas industry and the Niger Delta: Implications for the environment. *Journal of Applied Science and Environmental Management, 12*(3), 29–37. https://doi.org/10.4314/jasem.v12i3.55469

Ferrari, D. M., Soares, M. M., & Santos, M. R. (2019). Cognitive workload and human error in the oil and gas industry: A case study. *Journal of Loss Prevention in the Process Industries, 57*, 78–84. https://doi.org/10.1016/j.jlp.2019.01.013

Garcia, L., & Lopez, G. (2019). Evaluating the impact of training programs on reducing human error. *Human Resource Management Review, 29*(4), 350–360.

Garcia, L., & Martinez, L. (2021). Mitigating human errors through advanced training programs. *Journal of Occupational and Organizational Psychology, 94*(1), 45–56.

Geller, E. S. (2016). *The psychology of safety handbook* (2nd ed.). CRC Press.

Guldenmund, F. W. (2020). The nature of safety culture: A review of theory and research. *Safety Science, 34*(1–3), 215–257. https://doi.org/10.1016/S0925-7535(00)00014-X

Hernandez, J. A., & Martinez, R. A. (2017). The impact of organizational culture on human error and safety performance in the oil and gas industry. *Journal of Loss Prevention in the Process Industries, 47*, 23–31.

Hernandez, M., & Lopez, G. (2019). Understanding the influence of job rotation on human error. *Ergonomics, 62*(10), 1345–1356. https://doi.org/10.1080/00140139.2019.1621207

Hofmann, D. A., & Burke, M. J. (2017). The role of leadership in safety performance and culture. *Leadership in Health Services, 16*(1), 13–22. https://doi.org/10.1108/13660750310458742

Hofmann, D. A., & Stetzer, A. (2018). The role of safety climate and communication in accident interpretation: Implications for learning from negative events. *Academy of Management Journal, 41*(6), 644–657. https://doi.org/10.5465/256962

Hopkins, A. (2016). Studying organizational cultures and their effects on safety. *Safety Science, 44*(10), 875–889. doi:10.1016/j.ssci.2006.05.005

Jackson, T. L., & O'Connor, M. (2017). The impact of organizational culture on human error in the oil and gas industry. *Safety Science, 93*, 66–73. https://doi.org/10.1016/j.ssci.2016.11.015

Johnson, T., & Lee, K. (2018). Safety climate as a predictor of human error. *Journal of Occupational Health Psychology, 23*(3), 315–326. https://doi.org/10.1037/ocp0000094

Johnson, T., & Smith, J. (2021). Human error reduction strategies in high-risk environments. *Journal of Applied Psychology, 106*(3), 482–495. https://doi.org/10.1037/apl0000483

Khan, A., & Ali, S. (2020). The effects of cognitive overload on human error. *Journal of Cognitive Engineering and Decision Making, 14*(4), 286–299. https://doi.org/10.1177/1555343420965980

Kim, S. Y., Park, H. J., & Lee, S. J. (2018). The relationship between job stress and safety behavior: Moderating effects of supervisor support. *Journal of Occupational Health Psychology, 23*(1), 23–35. https://doi.org/10.1037/ocp0000075

Kumagai, S., Murata, K., & Tanaka, K. (2016). Safety culture and human error in the Japanese chemical industry: An empirical analysis. *Safety Science, 84*, 11–18.

Larsson, A., Dekker, S. W. A., & Tingvall, C. (2018). The importance of resilience in the oil and gas industry: Lessons from the Deepwater Horizon accident. *Safety Science, 105*, 10–20.

McCoy, J. M., McManus, B. N., & Ritchie, A. E. (2019). Human factors influencing safety in the oil and gas industry: A systems approach. *Journal of Safety Research, 69*, 27–34.

Nigerian Ministry of Environment. (2018). *Safety management survey report*.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.

Nwonu, C., Eze, J., & Oko, R. (2017). Optimizing sample size determination for experimental research. *International Journal of Research Methods, 25*(4), 89–105.

O'Connor, P., Flin, R., & Fletcher, G. (2017). Methods used to evaluate the effectiveness of flight crew CRM training in the UK aviation industry. *Safety Science, 45*(4), 481–500.

Obi, C. (2019). Oil extraction, dispossession, resistance, and conflict in Nigeria's oil-rich Niger Delta. *Extractive Industries and Society, 6*(2), 553–558.

Okechukwu, U., Chijioke, E., & Nnamdi, C. (2021). Human factors influencing safety performance in oil and gas installations: An African perspective. *Safety Science, 134*, 105087. https://doi.org/10.1016/j.ssci.2021.105087

Olawale, F., & Adeoye, A. (2020). Investigating the role of work environment on human error: Evidence from the Nigerian oil and gas sector. *Journal of Safety Research, 74*, 53–61. https://doi.org/10.1016/j.jsr.2020.01.006

Palali, A., & van Ours, J. C. (2017). Risk tolerance and job safety. *Labour Economics, 49*, 10–18.

Pidgeon, N. (2018). Safety culture: Key theoretical issues. *Work & Stress, 12*(3), 202–216. https://doi.org/10.1080/02678379808256865

Rasmussen, J. (1983). Skills, rules, and knowledge; signals, signs, and symbols, and other distinctions in human performance models. IEEE Transactions on Systems, Man, and Cybernetics, SMC-13(3), 257-266.

Reason, J. (2016). *Human error*. Cambridge University Press.

Salminen, S. (2018). A review of work-related human errors in safety-critical systems. *Safety Science, 105*, 77–82.

Smith, A., Karsh, B. T., Carayon, P., & Gurses, A. P. (2018). A systematic review of the literature on the relationship between workload and human error: Implications for patient safety in the oil and gas industry. *Applied Ergonomics, 68*, 334–347

Smith, J., & Davis, R. (2021). Exploring the link between human error and occupational safety. *Journal of Applied Ergonomics, 86*, 103–114.

Smith, J., & Johnson, R. (2018). Communication failures and human errors in high-risk industries. *International Journal of Human-Computer Interaction, 34*(5), 430–442.

Williams, P., & Brown, T. (2021). The role of leadership in preventing human errors. *Journal of Leadership & Organizational Studies, 28*(2), 174–185.

Williams, P., & Brown, T. (2021). The role of leadership in preventing human errors. *Journal of Leadership & Organizational Studies, 28*(2), 174–185.

Williams, P., Brown, T., & Taylor, S. (2019). Analyzing the impact of safety policies on human error. *Safety Science, 123*, 78–86.

Zimolong, B., & Trimpop, R. (2016). Risk perception. Encyclopedia of occupational health and safety, International Labour Organizations.