

Safety Culture and Safety Performance of Oil Servicing Firms in Rivers State

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Abstract

The study examined the relationship between safety culture and safety performance of oil servicing firms in Rivers State. Safety culture was studied using safety- communication and motivation, while safety performance has safety- compliance and participation. The study adopted a cross-sectional survey design while primary data was collected via the administration of a structured questionnaire. Copies of the questionnaire were administered to 123 managers and supervisors of eight selected oil servicing firms. Descriptive statistics were analyzed using simple frequencies and percents with the aid of the Statistical Package for Social Sciences (SPSS) version 27, while the Partial Least Square-Structural Equation Modeling (PLS-SEM) was deployed to test the hypothesized relationships via Smart PLS 3.2.6. Ordinal regression is used to ascertain the collective effect of the independent variable on the dependent variable. The results of the analyses show that dimensions of safety culture (safety-communication and motivation) significantly and positively correlated with measures of safety performance (safety- compliance and participation). The results revealed that, all the dimensions of safety culture amplify safety performance of oil servicing firms. Thus, it was recommended that oil servicing firms should seek suggestions from employees about how to improve safety by being open on safety issues and employees that are safety compliant should be rewarded. Also, management should ensure workers are aware of the potential risks and hazards in the workplace. Furthermore, employees of oil servicing firms should see safety as a lifestyle and partake in the development of safety requirements by putting effort to improve safety performance. It

further suggested that future studies be done in other sectors (e.g. banking, telecommunication and manufacturing) to proffer more general results.

Keywords: Safety culture, safety performance, safety communication, safety motivation, safety compliance, safety participation.

1. INTRODUCTION

Safety Performance (SP) is a critical component of organisational performance. The safety of organisations is a function of its safety performance in the day to day running of the organisation. Every organisation, no matter its size or status, sees safety performance as a major concern and it is significant to the realization of goals and objectives (Hameed et al., 2016). A high level of safety performance signifies the level of safety in the workplace (Mohamed, 2002). According to Gunduz and Laitinen (2018), safety performance refers to the level of safety in an organisation as occasioned by actions and inactions of employees, systems and structures. Specifically, safety performance is used to refer to the level of safety that determines the incidences of workplace accidents, injuries and fatalities (Mullen et al., 2017; Erdogan et al., 2018). Thus, safety performance is a concept that has come to stay and is currently gaining grounds in the workplace, among management scholars and experts (Hu, Griffin & Bertuleit, 2016). In this study, safety performance is bifurcated as a construct that comprises safety compliance and safety participation (Neal & Griffin, 1997) as important measures for enhancing safety performance in the work environment.

Safety Compliance represents the required core safety actions or behaviours that are needed to be implemented in order to retain a safe workplace (Hu et al., 2016). Neal and Griffin (2006) asserted that these actions or behaviour consists complying with the organisation's safety procedures and using the right personal protective equipment (PPE).

Hon et al. (2014) submitted that safety participation describes actions or behaviours that do not directly contribute to an individual's personal safety, but enhances the development of an environment

that bolster safety. These behaviours include: participating in voluntary safety activities, helping coworkers with safety-related issues, and attending or participating in safety meetings.

Safety culture construct refers to, and is used to, encapsulate and explain organisational safety (IAEA, 1991). According to Advisory Committee for Safety in Nuclear Installations (ACSNI) (1993), its purpose is to improve occupational safety in organisations, by preventing low frequency, high severity events (Chernobyl, Bhopal, Piper Alpha, Texas City, Deepwater Horizon), as well as high frequency, lower impact events (personal injuries) (ACSNI, 1993). Furthermore, safety culture is also used by organisations to describe the way safety is being managed to avoid catastrophes and personal injuries (Veltri et al., 2007), as well as being used to save lives and prevent safety disasters (Fernández-Muñiz et al, 2009). For the purpose of this study, safety culture is dimensionalized as safety communication and safety motivation (Glendon & Litherland, 2001; Vinodkumar & Bhasi, 2009).

Safety communication has been recognized as an effective way of improving safety performance in organisations (Ali et al., 2009). It helps management to track hazards and prevent accidents and injuries (Vredenburg, 2002). It also helps safety managers to ensure that employees are fully informed about safety and health policies, practices, concerns and other requisite information (Goetsch, 2011). In the same vein, Glendon and Litherland (2001) posits that safety communication (i) aids management to operate an open door policy on safety issues, (ii) serves as a reminder to the potential risks and hazards in the workplace, and (iii) encourages suggestions or way on how to improve safety.

According to Latham and Pinder (2005) and Clarke (2010), safety motivation has been conceptualized to determine safety in the workplace across a different range of industrial and organisational contexts and, also a psychological process that directs, energizes and sustains action (Scott et al., 2014). Furthermore, the significance of safety motivation include: (i) setting quality standards for safety with regards to firm, (ii) ensuring that safety procedures are carefully followed, and (iii) clearly considers the safety of employees vital to the organisation (Vinodkumar & Bhasi, 2009).

The oil industry remains the main stay of the Nigerian economy. This explains the interest in the safety performance of oil servicing firms in Rivers State. Hamilton and Ugorji (2006) revealed that studies by health and safety executives have shown that about 80% of injuries, accidents, near misses or death ought not to happen. According to them, the main problem is the failure to comply and apply that experience in practice, and the failure to participate in safety activities and act when clear warning signs appear.

Low level of compliance to legislations and international standards is a key factor responsible for poor safety performance of oil servicing firms in Nigeria. Legislations and internationally accepted guidelines are in existence and actually referenced in the different acts governing the oil industry in Nigeria but lack of compliance with these guidelines is a major factor in the poor safety performance of the oil industry. Similarly, Hammeed et al., (2016) submits that employees do not comply with workplace safety, which is evident because they do not use the appropriate personal protective equipment (PPE) and obey the laid down safety procedures when executing tasks.

Furthermore, in addition to low level of compliance, there is also a growing concern of low level of safety participation by employees in oil servicing firms. The Department of Petroleum Resources (DPR) (2019) submitted that most employees seldom participate in tasks that enhance workplace safety and take part in development of safety requirements.

No doubt, an aggregate of studies examining safety culture exist (e.g, Alrehaili, 2010; Agwu, 2012; Shuen & Wahab, 2016), and several scholars have also investigated safety performance (e.g, Griffin & Neal, 2000; Al-Bsheish et al., 2017; Nadhim et al, 2018). However, there seems to be few empirical studies to establish the relationship between safety culture and safety performance in Nigerian context, and specifically, among oil servicing firms; which leaves the study with a lacuna in literature. Consequently, this study seeks to investigate the relationship between safety culture and safety performance of oil servicing firms in Rivers State, Nigeria.

Conceptual framework of the study

Based on the foregoing, a conceptual framework is developed as shown below:

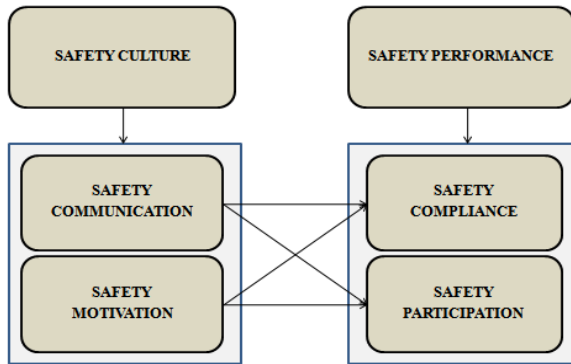


Figure 1: Conceptual Framework of the Study Source

The dimensions of the independent variable (Safety Communication and Safety Motivation) were adapted from Glendon and Litherland (2001) and Vinodkumar and Bhasi (2009) and the measures of the dependent variable (Safety Compliance and Safety Participation) were adopted from Neal and Griffin (1997).

The following hypotheses are formulated for this study.

Ho₁: There is no significant relationship between safety communication and safety compliance.

Ho₂: There is no significant relationship between safety motivation and safety compliance.

Ho₃: There is no significant relationship between safety communication and safety participation.

Ho₄: There is no significant relationship between safety motivation and safety participation.

2.0 LITERATURE REVIEW

2.1. Baseline Theories

2.1.1 Social Exchange Theory (SET)

Social exchange theory (SET) is among the most influential conceptual paradigms for understanding workplace behavior. Social Exchange Theory was developed in 1958, by the sociologist George Homans. After Homans developed the theory, two other theorists; Blau (1964) and Emerson (1976) continued to write about it. Blau focused on economic and utilitarian perspective while Emerson

focused on reinforcement principals which believe individual base their next social move on past experiences.

Homans (1958) defined social exchange as the exchange of activity, tangible or intangible and more or less rewarding or costly, between at least two people. According to Blau (1964), Social Exchange Theory proposes that when individuals (or other social agents like organisations) provide valued services, others typically respond with a certain level of obligation in response to and exchange for these services. Emerson (1976) postulated that “the Social Exchange Theory is not a theory, but more a framework of reference” (p. 359), meaning that other theories can assimilate and being compared from this point onwards.

The keystone of the social exchange theory is that interactions providing more benefits than costs will produce lasting mutual trust and attraction (Blau, 1964). These social relations involve both material benefits (i.e., salaries, bonuses, gratuities and allowances) and psychological rewards (status, loyalty and approval) (Yukl, 1994). Furthermore, SET was developed to (i) help people understand relationships well; why some relationships work while others fail, (ii) explain why we choose to start and continue only certain relationships, and (iii) explain communication and interaction, as well as the factors governing interaction in humans (DeJoy et al., 2010).

2.1.2 Expectancy Theory

Expectancy theory is a theory developed by Victor Vroom with direct application to work settings, which was later expanded and refined by Porter and Lawler (1968) and Pinder (1987). Vroom (1964) defined expectancy as “a momentary belief concerning the likelihood that a particular act will precede a particular outcome” (p.17). Outcomes in a work context incorporate things like salary increase, illness, injury, promotion, dismissal, peer acceptance, recognition and achievement (Wexley & Latham, 1991).

Vroom’s model emphasizes an individual’s maximal strength or capacity, rather than individual willingness, to carry out a specific task (Vroom, 1964). Vroom proposed three variables, which are vital in motivating employees. They are: Expectancy, Instrumentality, and Valence.

Expectancy is a person’s estimate of the probability that job-related effort will result in a given level of performance. Generally,

estimates of expectancy by employees lie between two extremes. Expectancy, ranging from 0 to 1, is based on probabilities. If an employee sees no chance that effort will lead to the desired performance level, the expectancy is 0. On the other hand, if the employee is completely certain that the task will be completed, the expectancy has value 1.

Instrumentality is an individual's estimate of the probability that a given level of achieved task performance will lead to various work outcomes. As with expectancy, instrumentality ranges from 0 to 1. For example, if an employee sees that a good performance rating will always result in a promotion increase, the instrumentality has a value 1. If there is no perceived relationship between a good performance rating and a promotion, the instrumentality is 0.

Valence is the strength of an employee's preference for a particular reward. Theoretically, a reward has a valence because it is related to an employee's needs. Valence provides a link to the need theories of motivation (Herzberg, 1968; Maslow 1970; Alderfer, 1972; McClelland, 1976). The reward such as promotion, peer acceptance, recognition by supervisors, might have more or less value to individual employees. Unlike expectancy and instrumentality, valence can be either positive or negative. If an employee has a strong preference for attaining a reward, valence is positive. At the other extreme, valence is negative. And if an employee is indifferent to a reward, valence is 0. The total range is from -1 to +1.

Vroom suggests that motivation, expectancy, instrumentality, and valence are related to one another by the equation:

$$M = E * I * V \text{ (Motivation = Expectancy * Instrumentality * Valence).}$$

According to this theory, if employees believe that their efforts will lead to increased performance, they will be more motivated (Holton, 1996). Furthermore, Expectancy-Valence Theory predicts that employees believe that complying with safety procedures and participating in safety tasks will produce valued outcomes if there is a motivational process that has been made towards them (Neal & Griffin, 2006; Hon et al., 2014).

2.2 Safety Culture

The concept of safety culture captured the interest and imagination of researchers and safety practitioners alike, with safety culture

research gaining increased momentum in 1980s and 1990s. An avalanche of studies and several references in major incident/accident investigations illustrate the significance of the concept. Mohamed (2003) averred that safety culture is a subculture of organisational culture, which has an effect on workers' behaviors and attitudes in regards to the safety performance in the organisation.

Uttal (1983) defined safety culture as “shared values and beliefs that interact with an organisation's structures and control systems to produce behavioural norms” (p. 23). Turner et al., (1989) defined it as, “the set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimizing the exposure of employees, managers, customers and members of the public to conditions considered dangerous or injurious” (p. 17). Furthermore, Mearns et al., (2003) postulated that safety culture forms the environment within which individual safety attitudes develop and persist and safety behaviours are promoted. The United Kingdom Health and Safety Executive (HSE) sees safety culture of an organisation as the product of the individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety management (HSE, 2005).

Safety culture is believed to be a key predictor of safety performance (Advisory Committee for Safety in Nuclear Installations (ACSNI), 1993). According to Choudhry et al. (2007), safety culture has become the focus of all the industries, intrinsically linked to organisational culture and has recently received much attention. Choudhry et al. (2007) stressed that safety culture is considered to be the main factor that influences employees' attitudes and behaviors in respect to safety performance. Safety culture can be encapsulated in the characteristics of the organisational culture that have impacts on attitudes and behaviors related to hazard control and elimination (Guldenmund, 2000). Although the term “safety culture” has been extensively used for many years, it has no clear definition or measurement (Cox & Flin, 1998; Guldenmund, 2000).

Safety culture is important because it forms the context within which individual safety attitudes develop, persist and safety behaviours are stimulated (Zohar, 1980). According to Veltri et al. (2007), safety culture is also used by organisations to describe the way safety is being managed to avoid catastrophes and personal injuries,

as well as being used to save lives and prevent safety disasters (Fernández-Muñiz et al., 2009). Thus, in general, safety culture is viewed as involving perceptions and attitudes as well as the behaviour of individuals within an organisation.

2.2 Dimensions of Safety Culture

2.2.1 Safety Communication

Communication between management and employees is another important aspect of organisations and also is a medium which leaders and followers structure, cultivate, and sustain useful exchanges (Cigularov et al., 2010). However, with the term “safety”, communication becomes a tool that helps employers manage safety issues and ensure that members in an organisation stay away from potential hazards and accidents (Alsamadani et al., 2013). Safety communication is not merely a process of exchanging safety information at the workplace; it is also concerned with influencing employees’ behaviour and attitudes towards safety (Hofmann & Stetzer, 1998). Siu et al. (2004) defined safety communication as a process of exchanging information between two or more people with regards to safety related issues. Furthermore, Glendon and Litherland (2001) posits that safety communication (i) aids management to operate an open door policy on safety issues, (ii) serves as a reminder to the potential risks and hazards in the workplace, and (iii) encourages suggestions or way on how to improve safety. However, ineffective safety communication has been shown to affect specific employees’ behaviours (Michael et al., 2006), and miscommunication frequently occurs among the workers, especially between employees and the upper-level management (Mullen et al., 2011); which may be due to the neglect of constructive safety communication at the workplace, implying the absence of a good safety culture atmosphere in the organisation (Conchie et al., 2013).

2.2.2 Safety Motivation

Motivation is recognized as a crucial thrust that directly or indirectly affects safety behaviour and the success of safety involvement in general (Lund & Aaro, 2004; Ajzen et al., 2009). It has been identified as a construct in well-known models of accident prevention (Christian et al., 2009; Vinodkumar & Bhasi, 2010). Neal and Griffin (2004)

defined safety motivation as “an individual’s willingness to exert effort to enact safety behaviours and the valence associated with those behaviours” (p. na). Latham and Pinder (2005) and Clarke (2010) averred that safety motivation has been conceptualized to determine safety in the workplace across a different range of industrial and organisational contexts and, also a psychological process that directs, energizes and sustains action (Scott et al., 2014). According to Vinodkumar and Bhasi (2009), significance of safety motivation include: (i) quality standards for safety with regards to production, (ii) ensuring that safety procedures are carefully followed, and (iii) clearly consider the safety of employees vital to the organisation. Yule et al. (2007) opined that in enhancing safety performance through safety culture the employees’ motivation is a central element, along with all other issues of safety dimensions. Fogarty and Shaw (2010) revealed that individual’s internal as well as external motivation, intention and willingness is required to boost safety performance. Moreover, the theory of performance by Campbell et al. (1993) suggests that safety motivation is linked with safety culture which in turn directly influences the safety performance.

2.2.3 Safety Performance

Safety performance indicates how healthy an organisation is terms of safety. According to Mohammed (2002), a high level of safety performance perfectly explains an organized workplace/worksites. Safety performance is perceived as multi-dimensional. It has been measured by several indicators. The numbers of accidents/injuries and near-misses are the most conspicuous indicators when measuring safety performance (Hon et al., 2014). Siu et al. (2004) defined safety performance as the ability to minimize the quantity of accidents and occupational injuries in the work sites. Burke et al. (2002) presents safety performance as activities that shore up the health and safety of clients, employees and environment etc, while Hinze et al. (2013) view safety performance has the quality of work that leads to a good safety record. Furthermore, Griffin and Curcuruto (2016) defined safety performance as employees’ conduct that depicts their actions in places of work to promote the health and safety all and sundry. Burke et al. (2002) submitted that safety performance is centered on keeping the workplace safe by the introduction of different interventions. These interventions (safety- compliance and participation) that attain safety

performance are mainly safety behaviors (Neal et al., 2000). Thus, an improved safety performance is needed to prevent employees from encountering accidents, near misses or death (Erdogan, et al., 2018).

2.2.3.1 Measures of Safety Performance

2.2.3.2 Safety Compliance

Borman and Motowidlo (1993) submitted that safety compliance is one of the components of performance (task performance) that is used to differentiate safety behaviours in the workplace. Safety compliance is defined as the core safety activities that need to be carried out by employees to maintain workplace safety (e.g., wearing personal protective equipment (PPE) and obeying tag-out and lockout procedures) that employees must engage in to maintain workplace safety (Neal & Griffin, 2006). Neal et al. (2002) defined safety compliance as sticking to safety procedures and performing work in accordance to the required safety standards. According to DeArmond et al. (2011), safety compliance are those compulsory behaviours that aid in the development of an environment that supports safety. They include complying with the organisation's safety procedures and using the appropriate personal protective equipment (Neal & Griffin, 2006). Additionally, Hu et al. (2016) proposed that safety compliance entails the requisite safety activities that are essential in maintaining a safe workplace.

2.2.3.3 Safety Participation

Safety participation is another component of performance (contextual performance) that is used to differentiate safety behaviours in the workplace (Borman & Motowidlo, 1993). Safety participation describes behaviours such as participating in voluntary safety activities or attending safety meetings. These behaviours do help to develop a workplace (environment) that supports safety (Borman & Motowidlo, 1993). Safety participation comprises a number of specific acts, such as helping others, voicing concerns about safety and looking out for the welfare of others (Neal et al., 2000). These acts are presented in the safety as belonging to a single class of behavior, which arguably implies that they are all of equal importance in predicting an organisation's safety performance (i.e., injuries, accidents and near-miss events). Furthermore, safety participation has a great voluntary element that goes beyond the actual 'work role'

that an individual has within an organisation (Clarke & Ward, 2006). Neal and Griffin (2006) concluded that if employees participate in safety activities this can lead to an increase of safety performance.

2.2.3.4 Empirical Review

Hassan et al. (2019) investigated the link between safety compliance behavior, safety communication and safety standard and procedure among workers in Malaysian SME's. The study utilized a questionnaire of 382 respondents from 50 SMEs. Data were analyzed using Statistical Package for Social Science (SPSS) software version 22.0 that involved data screening and hypothesis testing. The findings demonstrate that safety communication ($\alpha=0.715$) and safety rules and the procedure ($\alpha=0.783$) substantially correlated with safety compliance. The study concluded that the result would provide the SMEs with supplementary information on workplace safety, thus creating a safer and healthier working environment.

Shaheen et al. (2014) examined the relationship between safety climate/culture on safety performance, with safety motivation as moderator in Pakistan. Data was collected using convenient sampling technique, from a sample of 250 participants, while Pearson Correlation regression analysis was used to test the hypotheses. The result shows that safety climate/culture is negatively associated with safety performance ($\beta=-.011$, $R^2=.014$) while safety motivation is significantly associated with safety performance ($\beta=.927$, $R^2=.864$).

Al-Haadir et al. (2013) studied the effects of safety motivation and safety culture on safety behavior (safety- compliance and participation). Using a population of 430 employees, data was analyzed with Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). The finding shows that safety motivation has a good and positive influence on safety culture (0.62, $p < 0.001$). Safety culture also shows a strong positive influence (0.85, $p < 0.001$) on safety behavior (safety- compliance and participation). It was concluded that safety motivation can influence safety culture, and in turn influence safety- compliance and participation. In particular, a construction workplace in the Saudi context should place an emphasis on creating safety culture as it is the main player that leverages the use of safety motivation to achieve desired safety- compliance and participation.

Alrehaili (2010) studied the influence of safety culture on construction's personnel's safety performance in Saudi Arabia. With a population of 434 construction personnel comprising of project managers, engineers, and supervisors. Data was analyzed with Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). The findings revealed that safety culture has a significant effect on safety motivation ($\beta=0.19$, $p<0.001$) and personnel's attitudes toward violations ($\beta = 0.43$, $p<0.001$) and an insignificant effect on construction personnel's error behavior ($\beta = -0.31$, $p<0.001$). Safety motivation for construction safety has a direct effect on errors behaviors ($\beta = 0.093$, $p<0.001$). It was recommended that Saudi government construction management should provide more considerations for the scopes of safety culture in order to detect, and improve opportunities within the safety culture of these construction sites.

3.0 METHODOLOGY

3.1. Population and Sampling Method

The population of the study encompasses of all the oil servicing firms with operational/regional administration offices in Rivers State (verifiable from Petroleum Technology Association of Nigeria (PETAN) Member-Directory, website: www.petan.org). However, the target population for the purpose of this study consists of employees of eight selected oil servicing firms. These eight firms were selected due to less stress in accessibility to their management and location.

The accessible population of 123 was obtained from the management of the firms. However, since the population size is small (123) there would be no need resorting to drawing a sample as all the 123 respondents were surveyed.

3.2 Data collection, Questionnaire Design and Operational Measures

Data was collected via primary and secondary means respectively. Primary data was through responses of the questionnaire administered on the respondents, while secondary data was retrieved through association records, internet, journal articles and textbooks. The questionnaire was administered through direct mode, email and survey monkey. Of the one hundred and twenty-three (123) copies of

the questionnaire that were administered, 24 were rejected due to unsatisfactory information. The remaining 99 copies were used for analyses to determine the impact of safety culture on safety performance.

The questionnaire has three sections. Section A contains six items concerning demographic information of the respondents (e.g., gender, age, marital status). Section B has six indicators on Safety Culture. Safety Communication has three indicators. Examples is “Employees are consulted for suggestions about how to improve safety” (Glendon & Litherland, 2001), and Safety Motivation also has three indicators; e.g. “Management praises or says a good word to workers who pay attention to safety when working” (Vinodkumar & Bhasi, 2009). Section C has six items that pertain to Safety Performance with measures as Safety Compliance and Safety Participation (Neal & Griffin, 1997) with Safety Compliance having three items. Example is: “I use the correct personal protective equipment for the task I do”, while Safety Participation also has three items. Example is: “I often take part in development of the safety requirements for my job”. Apart from the demographic variables, all other indicators on the survey instrument were anchored on a five-point Likert scale of 1=Strongly Disagree to 5=Strongly Agree.

3.3 Data Analysis Techniques

Descriptive statistics (frequencies and percents) was achieved with the aid of the Statistical Package for Social Sciences (SPSS) version 27. Also, the means of the latent variables was established and sample observations were used to establish validity and reliability of the instrument. Furthermore, ordinal regression is used to ascertain the collective effect of the independent variable on the dependent variable. This tool is appropriate because the model meets the following conditions: (i) One or more or all of the independent variables are continuous, categorical or ordinal, and (ii) The dependent variable is measured on an ordinal. Furthermore, multicollinearity is tested before the final analysis (McCullagh, 1980). Finally, the four hypotheses (Ho₁- Ho₄) are tested via Partial Least Square-Structural Equation Modelling (PLS-SEM), with the aid of SmartPLS 3.2.6 (Ringle et al., 2015). The PLS-SEM is ideal because it can be used for small sample size and is distribution free (Hair et al., 2017).

4.0 RESULTS AND DISCUSSION

4.1 Demographic Characteristics of respondents

A total of 123 copies of the questionnaire were administered to managers and supervisors of oil servicing firms that was easily assessed. Ninety nine (99) copies of the questionnaire were correctly filled and were used for analysis. Below is table 4.1 showing the demographic characteristics of the respondents.

Table 4.1: Demographic Characteristics of the respondents

		Frequency	Percentage	Valid Percent	Cumulative Percentage
Gender	Male	79	79.8	79.8	79.8
	Female	20	20.2	20.2	100.0
	Total	99	100.0	100.0	
Age	20-35	11	11.1	11.1	11.1
	36-50	35	35.4	35.4	46.5
	51-above	53	53.5	53.5	100.0
	Total	99	100.0	100.0	
Marital Status	Single	23	23.2	23.2	23.2
	Married	65	65.7	65.7	88.9
	Separated	8	8.1	8.1	97
	Divorced	3	3	3	100
	Total	99	100.0	100.0	
Educational Qualification	WAEC-OND	11	11.1	11.1	11.1
	HND/B.Sc	67	67.7	67.7	78.8
	Masters above	21	21.2	21.2	100
	Total	99	100.0	100.0	
Position in the Organisation	Managers	39	39.4	39.4	39.4
	Supervisors	60	60.6	60.6	100
	Total	99	100.0	100.0	

Source: Research Data (SPSS Output) 2021

Table 4.1 shows the demographic details of the 99 respondents that participated in the study. For gender distribution, result shows that 79 respondents (79.8%) were males and 20 (20.2%) females. For age, respondents within 20-35 age brackets were the least with only 11 respondents (11.1%), while 51 years and above were the highest with 53 (53.5%). Respondents between the age brackets of 36-50 were 35 (35.4%) representing the total number of respondents. For marital status, 65 respondents (65.7%) were married, 23 (23.2%) were single, 8 (8.1%) were separated, while 3 (3%) was divorced. On highest level of educational attainment, 67 respondents (67.7%) have Higher National Diploma and Bachelor Degree, 21 respondents (21.2%) have Master Degree and above, while 11 respondents (11.1%) have The West African School Certificate and Ordinary National Diploma. Furthermore, for position in the organisation, there are 39 managers,

representing 39.4% of the total number of respondents, while 60 (60.6%) are supervisors.

Next is table 4.2 which shows the output for validity, reliability and multicollinearity.

Table 4.2: Test of Validity, Reliability and Multicollinearity

	AVE	SAC	SAM	SCL	SAP	Cronbach Alpha > 0.70	Composite Reliability 0.70-0.90	VIF
SAC	0.584	0.752				0.743	0.738	4.521
SAM	0.613	0.421	0.765			0.911	0.842	3.518
SCL	0.571	0.333	0.213	0.772		0.853	0.706	
SAP	0.562	0.244	0.154	0.101	0.776	0.921	0.821	

Source: SmartPLS 3.2.6 output on research data, 2021

Note: AVE = Average Variance Extracted. SAC = Safety Communication, SAM = Safety Motivation, SCL = Safety Compliance, SAP = Safety Participation. The off-diagonal values are the correlations between latent variables, while **the diagonal values in (bold) denote square roots of AVEs.**

Results from in table 4.2 reveals that the Cronbach's alpha values are not below 0.7 or above 0.9 (Hair et al., 2017). Furthermore, all the latent variables reported values for Composite reliability satisfied the 0.7 criterion (Hair et al., 2017). Thus, the instrument is reliable. It can also be deduced from the table that there is no multi-collinearity, since all the Variance Inflation Factors (VIF) (SAC = 4.521 and SAM = 3.518) for the dimensions are not highly correlated with each other.

Furthermore, convergent validity of the model is confirmed through the values of the Average Variance Extracted (AVE), which is above the recommended 0.50 threshold (Fornell & Larcker, 1981). The table also reported satisfactory that the model demonstrates discriminant validity since the square roots of the AVEs (diagonal values in bold) are higher than 0.70, and are far greater than the correlations between the constructs (the off-diagonal figures). This confirms that each construct is sufficiently distinct from any other one (Fornell & Larcker, 1981).

Next is table 4.3 which shows the output for the ordinal regression test.

Table 4.3: Ordinal Regression Test

-2 Logistic Likelihood = 109.485		
Intercept Only = 62.742		
Final score = 109.485		
Chi-Square = 62.248, p = 0.02 (< 0.05)		
Nagelkerke Pseudo R ² = 0.451		
Test of parallel lines Significance p > 0.05 p = 0.119		
Goodness-of-Fit, p > 0.05 Pearson = 0.782 Deviance = 1.302		
Dimension factor	Wald Statistic	Sig.
Safety Communication	12.346	0.002
Safety Motivation	7.385	0.001

Source: Research Data (SPSS Output), 2021

Table 4.3 shows that the Logistic Likelihood for Intercept Only (62.742), Final score (109.485), Chi-Square (62.248), and p-value of 0.02 reports a fit model between the dimensions of Safety Culture and measures of Safety Performance. Furthermore, the Goodness-of-Fit indices: Pearson (p = 0.782) and Deviance (p = 1.302) indicate that there is a fit between the proposed model and the data, since the p-values are greater than 0.05. The table also shows that 45.1% (R² = 0.451) variance was explained by Nagelkerke Pseudo R² to ascertain the extent to which all the dimensions of IT adoption jointly explain the variability in innovation.

Furthermore, the parameter estimates for the dimensions of IT adoption as reported by Wald statistic showed that each dimension significantly affects safety performance since the p-values are all less than 0.05 (SAC < 0.002 and SAM < 0.001). Finally, Test of Parallel Lines (p = 0.119) reveal that the slope coefficients in the model are the same across response categories since the p-value is greater than 0.05. Next is the test of hypotheses using the path coefficient and t-statistic criterion. As a rule, path coefficients (β values) of .10 to 0.29, .30 to .49 and .50 to 1.0 are weak, moderate and strong correlations, respectively (Cohen, 1988). Also, for a two tailed test, t values greater than 1.96 are significant, while t values less than 1.96 are non-significant (Hair et al., 2014). Table 4.4 shows the results of test for hypotheses.

Table 4.4: Test of Hypotheses

Null Hypothesis	Path (Relationship)	Path Coefficient (β)	Standard Deviation	t-Statistic	Decision
H ₀₁ :	SAC -> SCL	0.769	0.078	2.130	Not supported
H ₀₂ :	SAM -> SCL	0.809	0.067	2.220	Not supported
H ₀₃ :	SAC -> SAP	0.885	0.057	2.245	Not supported
H ₀₄ :	SAM -> SAP	0.791	0.052	2.223	Not supported

Source: SmartPLS 3.2.6 output on research data, 2021

Table 4.4 shows that there is a strong, positive and significant relationship between safety communication and safety compliance ($\beta=0.769$, $t=2.130$); a strong, positive and significant relationship between safety motivation and safety compliance ($\beta=0.809$, $t=2.220$); a strong, positive and significant relationship between safety communication and safety participation ($\beta=0.885$, $t=2.245$), and a strong, positive and significant relationship between safety motivation and safety participation ($\beta=0.791$, $t=2.223$). Therefore, H₀₁, H₀₂, H₀₃ and H₀₄ were supported.

The finding from the first hypothesis (**H₀₁**) revealed that there is strong positive relationship between safety communication and safety compliance. This means that management of the oil servicing firms should often keep employees abreast with the potential risks and hazards, when and if they do not comply with safety procedures or ignore the use of the correct personal protective equipment. Furthermore, management should also incorporate employees when matters of safety arise which should be by operating an open door policy on safety issues. This finding agrees with previous finding of Michael et al (2006) who stressed that an effective safety communication affects specific employees' behaviour, for example, safety performance (safety compliance).

The finding from the second hypothesis (**H₀₂**) shows that there is strong positive relationship between safety motivation and safety compliance. This implies that management should always acknowledge employees who are safety conscious and stick to safety procedures while performing their jobs and should also see employees and safety as important as the job. Furthermore, employees should adhere to all the safety procedures and use the appropriate personal protective equipment when working in order to increase performance. This finding is parallel with Zohar and Luria (2005) and Hofmann

and Mark (2006), who concluded that safety motivation through safety culture, will lead to improved safety compliance.

The findings from the third hypothesis (**H_{o3}**) reveal that there is strong positive relationship between safety communication and safety participation. This means that to improve on performance, management should welcome inputs from employees when making policies on safety by seeking suggestions on how to improve safety. Employees should also freely indulge in task or activities that help to improve workplace safety. This finding aligns with the submission of Lümker (2012) that organisations should be conscious to communicate about their organisations through the provision of efficient information about the organisational and departmental policies and goals regarding the future, which could lead to better safety participation.

Finally, the finding from (**H_{o4}**) reveals a strong positive relationship between safety motivation and safety participation. This means that employees who pay attention to safety should be adequately rewarded by management, which will spur them to put in extra effort to improve safety of the workplace. Management should as a matter of utmost importance, take the safety of employees serious by ensuring they receive safety training and attend safety meeting in order to enhance safety performance. This resonates the finding of Al-Haadi et al. (2013) that safety motivation can influence safety culture, and in turn influence safety participation. Also, management should place emphasis on creating safety culture as it is the main player that leverages the use of safety motivation to achieve desired safety participation.

5.0 CONCLUSION, SUGGESTIONS AND RECOMMENDATIONS

The results for this study form the basis for its conclusions about the relationship between safety culture and safety performance. The study affirms that safety culture contribute positively towards the safety performance of oil servicing firms in Rivers State. This is because management and employees have appreciable link with safety performance measures (safety- compliance and participation). This implies that oil servicing firms should be aware of the positive effect of safety culture on safety performance. Management should

collaborate with employees to take part in the development of safety activities and adhere to all safety procedures.

Furthermore, employees should put in extra effort to improve safety by attending safety meeting, ensure that the workplace is hazard free, and always use the correct personal protective equipment for the task assigned to them.

Based on the study, the following recommendations are made.

1) The oil servicing firms should seek suggestions from employees about how to improve safety by being open on safety issues. Furthermore, employees should always use the right personal protective equipment and also comply with all safety procedures to enhance safety performance.

2) Management should ensure workers are aware of the potential risks and hazards in the workplace, as well as adhere to all the safety procedures for the task that is being performed.

3) Employees of oil servicing firms should see safety as a lifestyle and partake in the development of safety requirements by putting effort to improve safety performance. Furthermore, Management should allow employees make contributions on policies for safety and also acknowledge their suggestions on how to improve safety.

4) The oil servicing firms should encourage/reward workers that are safety compliant and should consider the safety of all employees to be important as the job, while the employees should participate in safety activities such as attending safety/tool box meetings and report all safety related incidents to management in order to improve safety of the workplace.

5.1 Limitations for Future Research Directions

The study is limited on the basis of the identified parameters of geographical scope as its focus concentrated on oil servicing firms in Rivers State. Therefore, future studies should be extended to oil servicing firms in other oil producing states of the country.

Also, there is a noticeable gap in the characteristics of the oil industry and other sectors. The peculiarities in the population parameters of other sectors can account for divergent research results, findings and conclusions. Thus, future studies concerning the interactive nature of the variables should be conducted in sectors such as the banking, telecommunication and manufacturing.

Furthermore, future studies should investigate the predictive relevance of other variables on safety performance. The predictive value of variables such as: employee involvement, management commitment to safety, safety management system, leadership styles and employee behaviour.

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