



Exploring the Impact of Work-related Stress in the Nigerian Petroleum Industry

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

For decades, work-related stress has been a global menace impacting workers and Organizations. Work-related stress also adversely affects workers' health and productivity. Organizational leaders face the challenge of eliminating work-related stress to enhance profitability. The purpose of this qualitative multiple case study was to explore the impact of work-related stress in the petroleum industry, Niger Delta region, Nigeria. The study methodology was qualitative in nature and adopted multiple case study design. Participants were six supervisors who have

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successfully used strategies to reduce work-related stress in the Nigerian petroleum industry. Purposive sampling technique in qualitative research was adopted to reach participants. Data were collected from semi-structured interviews and internal company documents relevant to reducing work-related stress and analyzed using thematic analysis.

The responses of the research participants to the interview questions demonstrated a strong awareness of the negative impact of work-related stress. Work related stress leads to fatigue/burnout, negative workers' health and reduced profitability. Financial motivation, reduction of long working hours and excess workload; collaboration among the workers, supervisors, organizational leaders, and clients or customers and training on work life were suggested as a way forward.

Keywords: Work-related stress; petroleum industry.

1. INTRODUCTION

For decades, work-related stress has been a global menace impacting workers and organizations [1]. Yearly, European Union states incur a loss of 185 to 269 billion Euros and 50% to 60% lost workdays due to work-related stress [2,3,4,5,6]. Organizations globally incur more than 300 billion dollars' loss yearly due to work-related stress [7]. The definition of stress varies among researchers [8]. The origin of the word stress is the Latin word *stringi* which means to be drawn tight [2]. When an individual experiences a pressure or strain higher than what is normal, that the individual is under stress [9]. In medical terms, stress is defined as "a physical or psychological stimulus that can produce mental tension or physiological reactions that may lead to illness" [2]. Ref [2] described stress as the feeling a worker experiences when the worker thinks that "the demands exceed the personal and social resources the individual is able to mobilize." Work-related stress, also referred to as workplace stress or occupational stress, is the harmful physical and emotional responses that occur when the demands of a job do not match the capabilities, resources, or needs of the worker [10]. According to [11] work-related stress is the response people have when presented with pressures that do not match their knowledge and abilities, and that adversely impact their ability to cope. Work-related stress manifests in various forms among workers [12]. Researchers have identified different symptoms associated with workers who are under stress [2,13]. The symptoms of Work-related stress are; physical, psychological, medical, and social [14,15,16]. Work stress is the condition in which a worker feels unpleasant or unhealthy emotional experience toward a job, resulting in a diversion of interest from assigned responsibilities [17]. Based on the P-E fit theory, the amount of stress a worker experiences are directly related to the degree of mismatch between the worker and the

workplace factors [18,19]. The P-E fit theory describes the connection, link, similarities, or match between a worker and the organizational environment [20]. Factors like intelligence, skills, knowledge, capabilities, and personal characteristics, such as ambition, expectations, interests, and value system, can influence the needs or desires of the worker [20]. The environment refers to factors independent of the worker, which include job and the organizational characteristics [19,20]. Worker behavior can be affected by the interactions between the worker and the work environment [21,22]. Work-related stress also adversely affects workers' health and productivity (Oyelaran et al., 2017). Although, a small amount of work-related stress - called positive stress - is a motivator to perform tasks well for increased productivity [23]. Under such condition, the worker experiences eustress and so responds positively to stressors resulting in improvement in the worker's health and organizational productivity [24]. The negative impact of work-related stress on a worker's health adversely affects the worker's family and dependents [25]. Several studies exist on how work-related stress adversely impacts workers' health and organizational profitability. Research shows that the impact of work-related stress varies across workers and professions [26,19]. Organizational leaders need to identify and address the different organizational and environmental factors that impact work-related stress [27]. Each profession has its risk and buffer factors in relation to stress [28]. The impacts of work-related stress vary across nations and professions [26]. [29] noted that 70% of Nigerian workers studied experience work-related stress. There are no specific studies on how organizational leaders in the petroleum industry in Nigeria manage work-related stress. Because the major source of revenue to the Nigerian government is petroleum, any reduction in worker productivity in the petroleum industry would adversely affect both organizational

profitability and government revenue [30]. The Nigerian business environment is particularly stress inducing due to its socioeconomic structure [19]. Work-related stress has a major effect on workers' health and productivity in Nigeria [31]. Seventy percent of Nigerian workers experience work-related stress and organizations globally incur losses as high as 300 billion dollars per year because of work-related stress [29]. The general business problem is that work-related stress negatively affects worker productivity. The specific business problem is that some supervisors in the petroleum industry in the Nigerian Niger Delta region lack of understanding of work-related stress associated with the job task of the workers. Organizational leaders face the task of ensuring high workforce productivity to achieve organizational profitability [32]. Work-related stress causes increased absenteeism rates, negative emotions, worker withdrawal, psychological distress, counterproductive work behaviours, and job dissatisfaction [33,34]. The petroleum industry of the Niger Delta region is the major source of revenue for the Nigerian government [35]. Anything that affects the revenue from the petroleum sector directly influences the Nigerian economy [35]. The implication is that work-related stress may not only adversely affect worker productivity in the petroleum industry in Nigeria but also the revenue to the Nigerian government. Understanding work-related stress will apt putting in place strategies that may enhance not only the leadership skills of supervisors in the Nigerian petroleum industry but also organizational productivity and the Nigerian economy. The purpose of this qualitative multiple case study was to explore the impact of work-related stress in the petroleum industry, Niger Delta region, Nigeria.

2. MATERIALS AND METHODS

Research Method: There are three research methods a researcher can choose from and they are qualitative, quantitative, and mixed [36]. The research method a researcher chooses depends on the research phenomenon under study [37]. Using a qualitative research method, a researcher can potentially generate an in depth interpretation and understanding of people's personal experiences, social and material circumstances, and perspectives [38,39]. Through qualitative research, a researcher can identify and explore participants' views and experiences on a study phenomenon and social world [38,40,37,41]. Researchers who use the

qualitative method is interpretative, exploratory, or explanatory in approach and the study may result in the emergence of concepts [37,42-47]. The qualitative method is suitable for rich descriptive data and was adopted in this study.

Population and Sampling: The population under study was supervisors in petroleum companies in the Nigeria Niger Delta region who have successfully applied strategies to reduce work-related stress. Sampling is a central practice in qualitative research [48]. Using the right sample size ensures good representation of the population under study and validity and generalization of the research findings and conclusions [37,48]. If the sample size is too small, the data collected may not be enough to achieve informational redundancy or theoretical saturation [49]. In addition, if the sample size is too large, the data collected may hamper deep, case-oriented analysis a researcher needs for a successful study [50]. In a single case study, a researcher needs a large sample size to achieve external validity unlike a multiple case study design that the external validity increases irrespective of the sample size [41]. For a multiple case study design, a sample size of six to 10 participants with diverse experiences may be adequate to achieve data saturation [51]. The sample size of six from three selected petroleum companies was adequate to explore the depth of the research phenomenon. The used purposive sampling technique to select participants for the study. As noted by [52,53] researchers widely use purposive sampling technique in qualitative research to identify individuals or groups of individuals that are especially knowledgeable about or experienced with a research phenomenon. Purposive sampling increases the likelihood of accessing rich information and increases the efficiency in the sampling process by using the most informative candidates to enhance the value of the collected data [54]. A researcher should select participants that are knowledgeable in the research phenomenon [55]. In selecting participants, the study only included supervisors that had knowledge of work-related stress and successfully applied strategies to reduce work-related stress. When establishing the sample population, it is important to specify the inclusion or exclusion criteria [56,57,58,59]. The researcher contacted each organization's officer in-charge of research to identify the supervisors who had self-reported as experienced in work-related stress.

Ethical Consideration: Researchers must ensure ethical protection of research participants. Ethical protection of research participants involves discussion of the informed consent and the measures to ensure confidentiality of the research participants [60,61]. Researchers are required to provide study participants with information about the goal of the study and voluntary participation [56,41]. The research participants have the right to withdraw from a study at any time [41]. Having a written notification of withdrawal from a study may be helpful during audit verification or peer review [62]. The participants were informed of their right to abstain from the study at any time without being forced to provide justification or being questioned on the rationale for their decision. Permission was sought from the participants for audio recording of the interview session and also discussed their right to review the transcript of the audio record. No incentives were offered to encourage participation in the study. Researchers need to protect the research participants from harm while participating in a study [41]. We ensured that the participants were not exposed to any form of harm through their participation in the study. To maintain the confidentiality of the research participants and their organizations, we used pseudonyms to represent the participants and the organizations. Also secured the data collected on the media in a locked cabinet in a residence accessible only by the researchers, with data due to be destroyed after five years through breaking the media and disposing it in line with the waste management requirements of Akwa Ibom State of Nigeria.

Data Collection, Instrumentation and Data Organization: Data collection is a critical process in social research [63,37]. The use of appropriate data collection technique is necessary in enhancing the quality of a study [64,65]. In the study, different techniques of data collection to complement each other and enhance data validity were used. Data was gathered through face-to-face interviews. As required by the Nigerian government, the COVID-19 guideline of use of face mask and maintaining social distance of at least two meters was observed during the interview. Face-to-face interviews are effective in providing the opportunity for compelling interaction, nonverbal communication, empathy, and connectivity with the research participants [66]. Additionally, the technique is helpful in gaining the confidence and support of the research participants [66]. With face-to-face interaction, the researcher is not

merely a passive receiver of information but an active listener and so can validate the data gathered through non-verbal cues [67]. A disadvantage of face-to-face interaction is that the researcher may misinterpret the varying non-verbal cues from the different research participants [66]. The drawback was deciphered through member checking. The member checking process involved sharing the summary of the responses to the interview questions with the applicable research participant to confirm the interpretations align with the participants' views. Semi-structured interview questions were used to collect the data for the study. During interviews researchers should be active listeners and collaborating participants [67]. As the primary data collection instrument, research bias was guarded against and adopted the technique that enhanced the collection of rich data. In a semi-structured interview, researchers have the flexibility to use the interview process to gather the required data to create the desired knowledge [67]. Seven (7) semi-structured questions during the interview. Member checking is an effective means to ensure the accuracy of the data a researcher collects during semi-structured interviews [68]. The responses to the interview questions were summarized and shared with the applicable research participant to validate that the interpretations aligned with the participant's views. Where the research participant disagreed with the summary of the responses, follow-up interview was then conducted to clarify any ambiguity. Using multiple data sources is a strategy a researcher can use to enhance the validity of a study [37,41]. There are six commonly used data sources to enable triangulation [41]. The data sources are interviews, direct observations, documentation review, archival records, participant-observation, and physical artefacts [41]. It is important for researchers to track and maintain accurate and comprehensive record of the different activities involved in the data collection and analysis process [41]. The method a researcher uses for data organization should be such that the researcher can easily access the data for use [69]. There are various techniques a researcher can use to organize the data collected [37]. The techniques may include research logs, reflective journals, and cataloguing or labelling systems [37]. The data was organized from the different sources in this electronic format using a computer with password protection to ensure privacy. Using a computer to organize data enhanced orderliness and easier and simpler access to the data. A

locked cabinet was used to store the hardcopy materials that was collected during the study. The cabinet was only accessible by the researchers. In accordance with IRB requirement, all records will be maintained for five years and destroy thereafter.

Data Analysis: Qualitative data analysis is a process and consists of many actions and phases with differing purposes and results [70]. The process is fluid, non-linear, and sometimes chaotic [70]. Qualitative data analysis involves (a) compilation of the collected data, (b) dissecting the data collected into smaller units, (c) regrouping the units in relation to one another, the context, or conceptual framework to enable exhaustive description, identification of relationships between analytic units, or testing of certain concepts, and (d) interpretation of the themes in the context of the study [70,38,71,41]. After collecting the data for the study, data was organized into a form that enhanced order for creation of a database. The database was in Microsoft Excel format. Microsoft Excel is effective for data organization and visualization [72]. This is the compiling process. Disassembling process was used to identify the different types of data to enhance the identification of themes. During disassembling phase, compiled data was sorted using different labels. During the reassembling phase, the different labels were grouped for analysis. The essence of reassembling is to enable identification of themes based on similarities among the data labels or codes to enhance data interpretation [73]. In the interpretation phase, connection between the different themes were checked and the conceptual framework for the study. The essence of the interpretation phase was to make sense out of the data to enable deductions, inferences and conclusions from the research data. An inductive approach was used to identify new knowledge and evaluate possible connections between the emerging themes and the conceptual framework for the study. Initial coding was based on the key words from the participants' responses. The identified patterns were then grouped into themes that aligned with existing theories, concepts, and learning from the literature review and then presented the results in a graphical format. Methodological triangulation was used to validate the results of the data from the different sources. The data gather was compared through document review to the findings from the analysis of the interview data to enhance the research quality and mitigate potential bias. Thematic analysis is an

effective technique to identify patterns in a dataset [70,37,7,41]. The technique was appropriate to identify the different themes that contribute to mismatch between the workers and organizational factors. The method is a means for logical analysis of data through the identification of order, insights, patterns, pointers, concepts, and recurring ideas while reviewing and comparing the data from different sources [37,41]. Thematic analysis is appropriate for testing the impacts of the different organizational and environmental factors that cause mismatch with the worker. The deductive approach, a feature of thematic analysis, aligns with the conceptual framework for the study.

Reliability and Validity: For a multiple case study, achieving reliability and validity requires availability of the right research data, triangulation, peer debriefing, member checking, audit trail, and reflexivity [68]. Triangulation involves the combination of two or more methodological approaches, theoretical perspectives, data sources, investigators, or data analysis methods to study the same phenomenon [37]. Triangulation is a technique to enhance a wider and deeper understanding of a research phenomenon [74,37]. The dependability was improved on through member checking. A researcher can use member checking to reduce subjective interpretation of interview responses [68,75]. After each interview, the member checking process involved reviewing the summary of the responses with the respondent to confirm the interpretation was in line with the participant's viewpoint. Ref [76] identified technical accuracy in recording and transcribing as another way of improving dependability. After each interview, I restated the summary for the respondent to confirm accuracy. Document review was used to verify the authenticity of the data from the interviews. Also, data from multiple sources was used to enhance credibility through triangulation.

3. RESULTS AND DISCUSSION

3.1 Impact of Work-Related Stress in the Petroleum Industry

The respondents identified different ways work-related stress adversely affects organizations and workers. The responses of the research participants to the interview questions demonstrated a strong awareness of the negative impact of work-related stress. Similar to the observations of [77,78] that the impact of

work-related stress varies among workers, the respondents differed on the specific impact of work-related stress they identified, but they agreed that work-related stress is a contributor to reduced organizational profitability and lower worker productivity. P1 stated, “Work-related stress creates room for hazard and makes workers prone to injury.” P2 noted “Work-related stress causes fatigue, reduced efficiency, obscured judgment, irrational decision, unconscious tendency to take shortcut, and is a form of deferred accident.” P4 alluded that work-related stress causes “low output and stress-related illnesses.” P5 observed that a mismatch between workers’ needs and organizational factors adversely impacts workers’ health. The mismatch, according to P5, can be in the form of “the worker receiving limited support from the organization.” Similar to the observation of P4, P6 noted that work-related stress causes “reduced productivity.” The respondents’ observations aligned with prior findings that work-related stress is a major workplace challenge that organizational leaders need to eliminate, hence the need to focus on the strategies for managing the phenomenon [79,80]. Fig. 1 shows a summary of major themes based on research participants’ perceptions of the impact of work-related stress on the organizations and workers.

work stress leads to negative workers’ health and fatigue/ burnout; 3(16%) participants said reduced profitability. 2(11%) participants said increased workplace hazard, project delays and impaired judgement. While 1(5%) participants said increased workplace injuries and reduced worker efficiency.

Previous researchers have noted how the response to stress changes among workers [7,32,81]. Similarly, the respondents in this study differed on the stated impacts of work-related stress. Despite the differences, Fig. 1 indicates that work-related stress impacts both the organization and the workers. The direct impacts on the workers include fatigue or burnout, ill-health, impaired judgment, reduced efficiency, and increased workplace injuries. As noted by some researchers, when there is mismatch between a worker’s desires and the organizational needs, the worker experiences recurring negative emotions that may manifest in the form of fatigue, burnout, ill-health, impaired judgment, or reduced efficiency [7,21,82]. Such condition can adversely impact the psychological well-being of a worker [16]. To promote the psychological well-being of workers, organizational leaders need to encourage the culture of matching the conditions at the workplace with the workers’ needs to enhance work–life balance and work–family balance [16,22,83,84]. Based on the P–E fit theory, a poor match between the characteristics of a worker and the demands of the job is a source of stress [85,86,87,19]. The factors at the

Fig. 1 reveals the impact of work related stress based on the interview with supervisors from the selected oil and gas companies in Niger Delta, Nigeria. Majority of the participants 4(21%) said

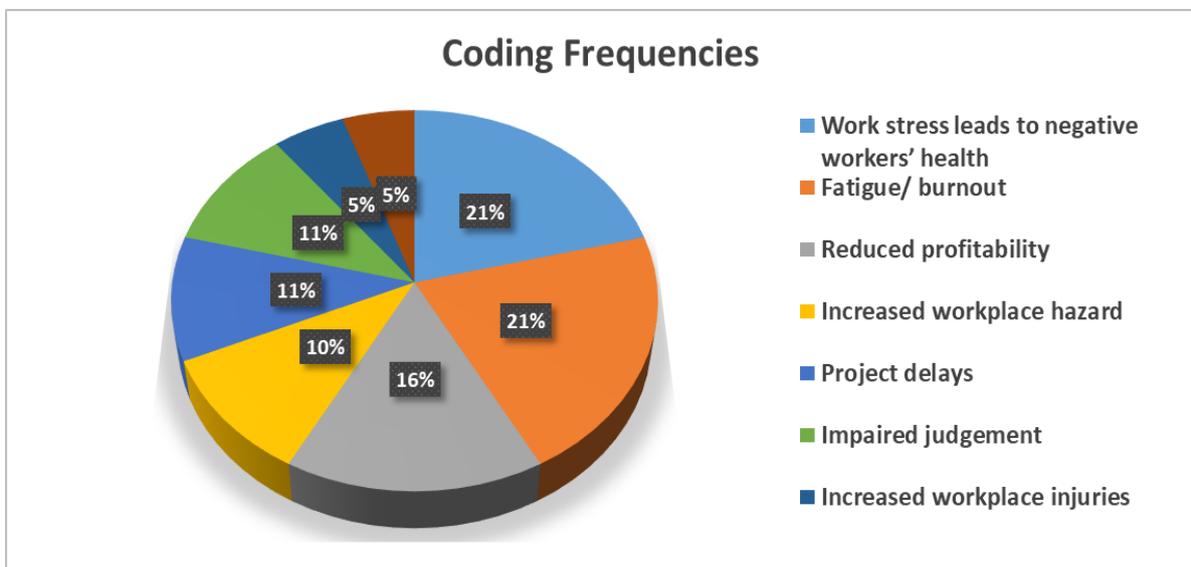


Fig. 1. Impact of work-related stress

workplace that cause or contribute to the mismatch are workplace hazards [88,89]. Such a hazard, as noted by P1, “makes workers prone to injury.” Workplace injuries directly impact the worker but may also be a contributory factor to project delays due to difficulty in hiring competent replacements for injured workers [90,91]. Some respondents identified reduced worker efficiency as a consequence of work-related stress. This observation aligns with the Inverted-U model that a worker requires some amount of stress to enhance productivity, but when the stress rises above a certain threshold, workers are demotivated and become less productive [92]. Many researchers have also noted that a large amount of work-related stress is detrimental to the physical and psychological well-being of workers and impacts worker productivity [92,15]. Respondents identified reduction in efficiency of workers as an impact of work-related stress, and reduction in worker efficiency is directly related to reduction in organizational profitability [92,15,3,4]. The respondents also identified project delays and reduced organizational profitability as organizational consequences of work-related stress. The respondents’ observations align with the conclusion of some researchers that project delays and the negative publicity due to workplace injuries may lead to decreased patronage, shareholder apathy, reduced customer trust to deliver on commitments, and high worker turnover, thereby adversely impacting organizational profitability [31,90,91]. The observations by the respondents on the impact of work-related stress align with the conclusions of many researchers that a large amount of work-related stress is detrimental to workers and the organization [12,7]. Considering the impacts of work-related stress, there is the need for both workers and organizational leaders to explore strategies to enhance a match between workers and organizational factors in line with the P–E fit theory [92].

4. CONCLUSION AND RECOMMENDATIONS

Work-related stress is a challenge in the petroleum industry. The phenomenon adversely impacts workers’ health and productivity and reduces organizational profitability. The purpose of this qualitative multiple case study was to explore the impact of work-related stress in the petroleum industry, Niger Delta region, Nigeria. The responses of the research participants to the interview questions demonstrated a strong awareness of the negative impact of work-related

stress. Work related stress leads to fatigue/ burnout, negative workers’ health and reduced profitability. Despite the adverse impacts, work-related stress can be managed.

4.1 Recommendation

Some strategies for managing work-related stress involve significant or additional financial investments while others do not require significant or additional monetary commitment. Financial motivation is an instrumental technique to help reduce the consequence of stress among workers thus employers in the industry should pay workers appropriate remuneration for work done and in cases where they work extra time, bonuses should be given.

Employers in the petroleum industry should ensure that the long working hours and excess workload of employees is reduced and ensure they teach their workers proper time management strategies to reduce the degree of stress at work.

Effective work-related stress management needs involvement of all the stakeholders in the petroleum industry. Such approach requires collaboration among the workers, supervisors, organizational leaders, and clients or customers. Communication is a vital tool that can be used to reduce stress by encouraging feedback from employees to help provide solutions to their problems. Accessibility of HRM managers is vital and it is pertinent that corporate business news is followed up.

Trainings should regularly be conducted to teach employees how to balance worklife and family life because when both are not properly managed, workers can experience constant fatigue and ill health.

DISCLAIMER

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DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image

generators have been used during writing or editing of manuscripts.

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Before the commencement of the study, approval was gotten from Walden University IRB approval (#02-19-21-0723263) and complied with the IRB's guidance and the direction established in the Belmont Report to ensure ethical protection of research participants.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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