

Occupational stress among workers at an oil company in Pointe-Noire, Congo-Brazzaville.

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Abstract

Introduction: Work-related stress is an ongoing psychosocial risk in the workplace. The oil industry, because of its complexity, is a high-risk sector. The objective of this work was to assess the level of work stress among workers of an oil company in Congo-Brazzaville. **Methods:** This was a cross-sectional descriptive study conducted between July and September 2021 among a population of workers at an oil company in Pointe-Noire. Data were collected using the Perceived Stress Scale (PSS 10). **Results:** The study involved 203 workers. Male staff was predominant (81.3%) with an average age of 39.5 years. The calculation of PSS 10 scores revealed that 39.4% of workers experienced moderate and high stress (score greater than 14). The prevalence of stress was higher among those under 30, female workers, expatriates and those working in administrative sites (57.1%, 52.6%, 52.6% and 46% respectively). There was a significant correlation between the presence of moderate or high stress and the workplace ($r=-0.17$; $p=0.015$). **Conclusion:** This study showed that the employees of this oil company suffered from a state of stress whose origin may be linked to certain socio-professional factors. Prevention will result from a thorough analysis of these factors and the identification of other psychosocial factors.

Keywords: Occupational stress, oil company, Pointe-Noire.

Introduction

Stress, a theme that is increasingly being addressed within companies. It is sometimes considered positive, sometimes more negative [1]. Medically, stress is a mixture of physiological and neurological changes. This term goes even further by referring to a set of mechanisms, both biological and psychic [2].

Ergonomically, the sources of stress are almost unlimited. There are different models for assessing stress and determining its factors. According to Karasek, stressful work situations are those that associate high psychological demand with low decision-making latitude [3]. These situations result in cardiovascular risks, psychological distress, depression, anxiety, burnout and increased use of psychoactive medications [4].

Although it is not a pathological phenomenon, stress is considered the evil of the 21st century given the human, economic and social costs it generates [1]. About 22% of European workers are involved. The International Labour Office (ILO) estimates the cost of stress between 3% and 4% of gross domestic product (GDP) [3].

In addition, in this current COVID-19 pandemic, the organizational work environment has changed dramatically. Many companies have changed their work practices and procedures to adapt to the new requirements to protect workers and consumers from the risk of contagion [5].

In Congo, the employees of TotalEnergies EP Congo are no exception. They are exposed to pressures related to the constraints of complying with barriers, difficult social or family life with long periods of

isolation at sea, mandatory quarantines, repeated nasopharyngeal sampling, fear of contracting COVID-19, telework or temporary closure, wage cuts, downsizing and more.

In the face of this changing environment with major occupational health and safety challenges, in addition to the weight of the COVID-19 pandemic, this work was conducted at Pointe-Noire in Congo-Brazzaville to assess the level of work stress among workers of this oil company.

Materials And Methods

1. Framework, type and study population

The study was conducted by an oil exploitation and production company in the Pointe-Noire department, which is the economic capital of Congo-Brazzaville. It was an observational, descriptive and cross-sectional study that collected prospective data from July to September 2021, which lasted 3 months.

The study population, recruited on a comprehensive sampling basis, consisted of all oil company personnel. The workers were selected during the periodic and hiring medical examinations carried out during the study period.

2. Study method

2.1. Data collection

The data was collected using a perceived stress scale (PSS10) previously programmed on the computer with the KoboCollect application.

IFCP 10 assesses the perception of stressful experiences in the previous month using a five-point Likert scale [6]. It contains 10 items, five of which are positive and five negative, and responses range from 0 to 4 (0 = never; 1 = almost never; 2 = sometimes; 3 = quite often; 4 = very often).

Individual scores on PSS 10 can range from 0 to 40, with the highest scores indicating high stress.

- Score from 0 to 13: low stress,
- Score de 14 à 26 : stress modéré,
- Scores de 27 à 40 : stress élevé.

Most questions reflect negative feelings and the inability to manage stress, although some questions deal with positive emotions and the ability to act in stressful situations. All items were designed to identify the extent to which respondents rate their lives as unpredictable, uncontrollable and overloaded, and include core components of the stress experience.

2.2. Study variables

The different data from the survey collected from the questionnaire were first the independent variables including age, sex, marital status, employee college (framework or not), company status (local or expatriate), the work site and secondarily the main stress-dependent variable.

3. Criteria for Judgement

Stress was identified by analyzing scores from the PSS10 grid.

- The absence of stress noted as “Absence (-)” was obtained by a score less than or equal to 13 points.
- The presence of stress rated “Presence (+)” was obtained by a score of 26 points or more.

4. Statistical Analysis

The entry was made with the KoboCollect application and the data processing was done with the Microsoft office Excel and Rstudio software version 4.1.0.

The analyses made on the study sample were univariate and bivariate to look for associations between two variables.

All analyses were performed with a 5% α error and a 95% confidence interval. The p-value corresponds to the probability that the observed association appears by chance. When the p-value was less than 0.05, the association between the two category variables was said to be statistically significant.

Results

1. General and socio-professional characteristics of the population

During the study period, 203 oil company workers were included, representing 28.9% of all employees (n=703). The participation rate over this period was 100% of workers received during statutory medical examinations.

The age extremes were 25 and 61 years with an average age of 39.5 9.6 years.

The Sex Ratio (F/H) was 0.23.

Table I provides a summary of all epidemiological parameters for the study population.

2. Prevalence of stress

The average PSS10 score for the study population was 12.8. As shown in Table II, 39.4% of workers had an average PSS10 score above 14.

3. Bivariate analysis

3.1. Population characteristics and prevalence of stress

Depending on the socio-professional characteristics, as shown in Table III, the prevalence of stress showed a statistically significant difference than in the work site variable. Workers working in administrative offices had a stress prevalence of 46% compared to their colleagues working on construction sites (28.6%).

3.2. Population characteristics and average PSS10 score

Based on the average stress score obtained with PSS10, divorced marital status workers and expatriate workers had higher average scores, as shown in Table IV.

Discussion

This work was accomplished using the Medical Observatory Method of Stress, Anxiety and Depression [7]. This is a frequently used model for assessing stress in the workplace. The comprehensive non-probability suitability sampling resulted in a satisfactory sample size to perform the analyses and provide a value judgment. However, it is possible that the results of this study are underestimated as the information takes into account that a three-month period and therefore the sample size may be less representative.

In this work, the prevalence of stress was 39.4% and an average PSS10 score of 19 among workers under stress. This prevalence is higher than in other studies. In France, when assessing work stress, the authors found a prevalence of 22% [1]. However, our prevalence was lower than that of studies conducted by Manga, which found a 51.7% proportion in a population of 58 migrant workers in Cameroon at an oil pipeline pumping station [8] and 71.8% among 142 pharmacy workers in Douala [9]. In Benin, among employees of an insurance company, the authors found a prevalence of stress of 81.8% [10]. In contrast, in a study on the assessment of stress among staff serving refugees and asylum seekers in Dakar, the authors found a prevalence of stress of 40.4% [11]. The differences in stress prevalence observed between these studies could result from the methodology used by each of the authors. In this study, the perceived stress scale PSS10 was used to measure stress while the choice was made on the Karasek questionnaire in other work where stress prevalences were very high.

A negative correlation was found between age and stress level, meaning that the stress level of workers in this society decreased with age. This would be explained by the fact the mastery of emotions and the experience are acquired over time. In contrast, some authors found that the perception of stress increased with the age of workers [12,13].

The stress level was almost 2 points higher for women. This is similar to other authors [12,14]. Clearly, health inequalities are well known between men and women. First, social conditions make women more likely to verbalize their suffering and stress. Secondly, they more systematically combine domestic and professional tasks. Finally, women are objectively confronted with more stressful tasks, involving more rigour, self-control and resignation to authority.

From the point of view of the professional college of the worker. Non-management workers had a high level of stress compared to managers. Being a non-manager increased stress scores among workers by 3.58 points. These results are consistent with those found by the Vaillant team, which also found that executives were on average less stressed than others because they earn higher salaries, which is likely to increase their quality of life [12].

The expatriate workers of this company came mainly from France, they were more stressed than their local colleagues. Perone and his team also make the same observation. For them, expatriation, while rewarding in terms of experience, generates a certain degree of disorientation, confusion and anxiety among expatriate workers. This may be due to adaptation to the new environment [15].

The perception of stress was found to be higher among workers at shore-based administrative sites than those at onshore and offshore sites with greater organizational and temporal constraints. This could be explained by the fact that in this work, employees of all backgrounds were included during their annual medical examination. The shift workers on the site carried out their medical examinations only during their rest period. To this end, the pressures associated with onsite or offshore work are reduced during this temporary vacancy period. On the other hand, workers at administrative sites carry out their annual medical examinations during their working period by being regularly exposed to the psychosocial factors present at the workplace.

Conclusion

Stress is an important mechanism of workplace self-defence, but it remains a major concern for the physical and mental health of workers. This work showed that the workers of this oil company suffered from a state of stress whose origin may be linked to certain socio-professional factors such as age, sex, occupational categories and place of exercise. Thus, this preliminary table, provides us with indications on prevention that will lead to a thorough analysis of these factors and the identification of other psychosocial factors.

Contribution Of The Authors

- Dr EBATETOU ATABOHO Ebenguela was actively involved in all phases of the study (research protocol, carrying out the study, writing and corrections of the manuscript.).
- NGUISSALIKI NGAMBOU Marliti participated in the drafting of the research protocol, the collection of data in the field, their processing, the verification of the results and the proofreading of the final manuscript format).

Conflict Of Interest

The authors do not declare any conflict of interest.

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Lists of tables

Table I: Distribution of workers by socio-professional characteristics

Variables	Frequencies (N=203)	Percentage (%)
Age (years)		
< 30	7	3.4
[30 ; 40[	108	53.2
[40 ; 50[	69	34.0
[50 ; 60[	18	8.9
≥ 60	1	0.5
Sex		
Male	165	81.3
Female	38	18.7
Marital status		
Single	63	31.0
Married	135	66.5
Divorced	5	2.5
Professional College		
Executive	114	56.2
Non-Executive	89	43.8
Status		
Expatriate	19	9.4
Local worker	184	90.6
Work site		
Administrative Offices	126	62.1
Operational sites (on/offshore)	77	37.9

Table II: Prevalence of perceived stress among workers

Stress	Workforce	Percentage (%) [IC95%]	Score PSS10	
			Average	SD
Absence (-)	123	60.6[53.87 – 67.31]	9.0	3.0
Attendance (+)	80	39.4[32.69 – 46.13]	18.6	4.8

SD: Standard deviation

Table III: Stress prevalence by socio-professional characteristics of workers

Variables	Stress		p-value
	Absence N (%)	Attendance N (%)	
Age (years)			0.811
< 30	3 (42.9)	4 (57.1)	

[30 ; 40[	66 (51.1)	42 (38.9)	
[40 ; 50[	42 (60.9)	27 (39.1)	
[50 ; 60[	11 (61.1)	7 (38.9)	
≥60	1 (100.0)	0 (0.0%)	
Sex			0.064
Female	18 (47.4)	20 (52.6)	
Male	105 (63.6)	60 (36.4)	
Marital status			0.137
Single	37 (58.7)	26 (41.3)	
Divorced	3 (60.0)	2 (40.0)	
Married	83 (61.5)	52 (38.5)	
Professional College			0.788
Executive	70 (61.4)	44 (38.6)	
Non-executive	53 (59.6)	36 (40.4)	
Status			0.215
Expatriate	9 (47.4)	10 (52.6)	
Local worker	114 (62.0)	70 (38.0)	
Work site			0.013
Administrative Offices	68 (54.0)	58 (46.0)	
Operational sites (on/offshore)	55 (71.4)	22 (28.6)	

Table IV: Average PSS10 scores by socio-professional characteristics of workers

Variables	Score PSS10		|r| (p)
	Average	Standard deviation	
Age (years)			-0.08 (0.228)
< 30	14.29	6.4	
[30 ; 40[	13.12	6.26	
[40 ; 50[	12.49	5.91	
[50 ; 60[	11.67	4.89	
≥ 60	2	0	
Sex			-0.11 (0.116)
Male	12.44	6.02	
Female	14.15	6.03	
Marital status			0.03 (0.620)
Single	12.62	5.03	
Married	12.75	6.5	
Divorced	15.2	5.85	
Professional College			0.04 (0.615)
Executive	12.58	5.78	
Non-executive	13.01	6.4	
Status			0.03 (0.693)
Local worker	12.54	1.53	
Expatriate	14,95	9,05	
Work sites			-0.17 (0.015)
Administrative Office	14	6.33	
Operational site (On/offshore)	11.45	5.33	