

# Occupational Stress and Associated Factors among Workers in the City of Abidjan (Côte D'Ivoire)

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## Abstract

**Context:** Occupational stress constitutes a major public health problem due to its impacts on the physical, psychological, and social health of workers. In Côte d'Ivoire, despite the rapid growth of economic activities in Abidjan, scientific data on the prevalence and factors of occupational stress remain limited. **Objective:** This study aims to determine the levels of occupational stress and to identify the main factors associated with it among workers in the district of Abidjan. **Methodology:** The study is descriptive and cross-sectional. A total of 600 questionnaires are distributed and 445 valid ones are used, with a response rate of 74.1%. Sociodemographic, professional, and psychosocial data are collected, and the level of stress is assessed using a questionnaire designed based on Legeron's recommendations. Statistical analyses (Chi<sup>2</sup> tests, Kruskal-Wallis test, and linear regression) are carried out with the XLSTAT 2021 software, with a significance threshold set at  $p < 0.05$ . **Results:** According to the results, 36.6% of participants present high stress and 28.3% extreme stress, reflecting a concerning prevalence. Workers and supervisors appear as the most affected categories, while executives generally present moderate levels. The main factors identified are work pressure, professional frustrations, and organizational changes. **Conclusion:** Ultimately, occupational stress among workers in Abidjan reaches alarming levels and constitutes a challenge for public health and productivity. These results highlight the necessity of implementing institutional strategies for the prevention and management of stress, adapted to the Ivorian socio-economic context.

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## Keywords

Occupational Stress, Prevalence, Stress Factors, Occupational Health, Abidjan

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### 1. Introduction

Stress has today become an important social disease, due to its increasing prevalence and its diverse consequences (Giorgi et al., 2020; Ganster & Rosen, 2013). This phenomenon affects the physical, psychological, and social integrity of individuals, and its intensity depends on the subjective assessment of experienced situations (Godoy et al., 2018; O'Connor et al., 2020; Osborne et al., 2020). In our modern societies, daily constraints (family, environmental, financial, transport) add to professional pressures to create a permanent tension (Harvey et al., 2017; Giorgi et al., 2020). Occupational stress indeed constitutes a particular form of this phenomenon. Defined as a psychobiological response to a perceived imbalance between the demands of the work environment and the resources of the individual, it is manifested by a concerted activation of the neurobiological, endocrine, and immune systems (Godoy et al., 2018; Reale et al., 2020; McGee et al., 2023). This phenomenon, impacting quality of life and performance at work, is the subject of growing scientific interest due to its economic and social consequences (Harnois & Gabriel, 2000; Werke & Weret, 2023).

On the neurophysiological level, in the short term, stress is an adaptive response that allows the mobilization of energy and the increase of vigilance, and that improves motivation and performance, particularly in a professional task. But when it becomes chronic, it has disadvantages. By repeatedly soliciting the physiological adaptation systems, stress induces an allostatic load that can disrupt body homeostasis (McEwen et al., 2015; Reale et al., 2020; McGee et al., 2023). The Hypothalamic-Pituitary-Adrenal (HPA) axis and the Autonomic Nervous System (ANS) are at the core of this mechanism. Indeed, prolonged exposure to stress factors causes chronic hypercortisolemia, which leads to structural and functional changes in the hippocampus, prefrontal cortex, and amygdala, essential areas of memory, attention, and emotional control (Arnsten, 2015; Lupien et al., 2018). These modifications account for the range of observed symptoms, which range from cognitive and emotional deterioration to somatic conditions such as arterial hypertension, metabolic diseases, and cardiovascular disorders (Thayer et al., 2012; Russell & Lightman, 2019). These modifications are also the cause of frequent decreases in motivation and performance among workers subjected to constant stress (Wingenfeld & Wolf, 2014; Lupien et al., 2018). From a psychosocial point of view, occupational stress has significant consequences. It promotes the onset of burn-out, anxiety disorders, and depression, and contributes to the adoption of compensatory behaviors such as smoking, alcoholism, and a sedentary lifestyle, thus aggravating cardiovascular and metabolic risks (Harvey et al., 2017; Sandi & Halter, 2015). Research indicates that the chronicity of these stress factors is associ-

ated with an overactivation of the sympathetic system and a change in heart rate variability, signs of a neurovegetative disorder (Thayer et al., 2012).

On the epidemiological level, numerous studies have demonstrated the associations between health and work stress. According to Murtin et al. (2024), more than one-third of workers in the United States in 2015 were in a state of “job strain”, that is, an imbalance between demands and resources. In Portugal, a study carried out on 1702 workers indicates that nearly half of them present at least one symptom of burnout (Gaspar et al., 2024). According to other studies, burnout proves to be “concerning” in several sectors and countries, with prevalence rates ranging from 2.4% to 72%, depending on the professions and evaluation techniques (Carod-Artal & Vázquez-Cabrera, 2012; Edú-Valsania et al., 2022; Amiri et al., 2024). According to Amiri et al. (2024), the global prevalence of burnout among health professionals can rise up to 67%. According to the World Health Organization (WHO), these problems generate each year an economic cost exceeding 1000 billion dollars, due to absenteeism, presenteeism, and a decrease in productivity (Harnois & Gabriel, 2000). In African contexts, the situation is all the more alarming because of the acceleration of urbanization, economic instability, and the lack of preventive institutional strategies. Numerous studies indicate that more than 40% of workers in Sub-Saharan Africa suffer from a high level of work stress, linked to anxiety and depression problems. For example, a study conducted among academic staff in Ethiopia reports a prevalence of 60.4% of occupational stress (Kabito et al., 2020), while among nurses, the prevalence of burnout varies from 33% to 87% depending on the measurement tools (Owuor et al., 2020; Aberhe et al., 2024). In the Ivorian context, despite some research on specific fields such as education or health, the information remains insufficient and scattered (Kadjo et al., 2019; Guiegui et al., 2022; Kouadio et al., 2023).

Although the global literature has established a solid correlation between chronic stress, neurophysiological dysregulations, and occupational health, the application of these results in African contexts remains little studied. There still exists a significant gap regarding the determination of the specific elements that affect occupational stress in urban environments of developing countries, such as Côte d’Ivoire. Thus, the main question of this study is posed as follows: what are the levels of occupational stress and the associated factors among workers in Abidjan? It is necessary to answer this question in order to establish adapted preventive strategies, which can mitigate the effects of stress on workers’ health and optimize productivity in socio-economic contexts in constant evolution.

The general objective of this study is to examine the levels and factors associated with occupational stress among workers in the district of Abidjan. To achieve this general objective, the following specific objectives are targeted:

- To describe the sociodemographic and professional characteristics of workers in the district of Abidjan.
- To assess the level of occupational stress according to these sociodemographic and professional variables.
- To identify the main occupational stress factors among these workers.

## 2. Materials and Methods

### 2.1. Material

#### 2.1.1. Study Site

The present work is carried out in Abidjan, the most populated city and the economic capital of Côte d'Ivoire. As an economic capital, Abidjan is stressful for people who live or work there, given various factors. Indeed, permanent traffic causes daily stress for workers, which can have a negative impact on their mental health and productivity (Benie Bi Vroh et al., 2016; Kouamé, 2016). Moreover, the rapid urbanization of this city leads to a high population density and overpopulation in certain neighborhoods, which increases the risks of stress linked not only to noise pollution and air pollution, but also to socioeconomic precariousness and the professional environment (Schilling et al., 2019; Gozé, 2023). Environmental factors, such as air pollution and noise, are recognized for their harmful effects on the mental and physical health of city dwellers. Abidjan, through its rapid and sometimes anarchic urbanization, requires special attention to mitigate these urban challenges (Gakuba et al., 2015).

#### 2.1.2. Type and Duration of the Study

The study is descriptive with a cross-sectional collection method. It took place over a period of three (03) months in the different professional districts of Abidjan, particularly in the densest areas such as Plateau, Cocody, and Marcory. The survey sessions are conducted at workplaces, during break times or after the daily service, to minimize disruptions in the participants' activities.

#### 2.1.3. Subjects

The study is conducted among active workers in various sectors of activity in Abidjan, notably public administrations, private companies (small, medium, and large enterprises), and independent activity sectors. All subjects are met in Abidjan within the framework of this study.

#### 2.1.4. Technical Material

##### 1) Data collection tool

Data are collected using a questionnaire describing two (02) sections:

- The first section makes it possible to collect general information about the participant, such as age, sex, marital status, professional situation, number of children, and place of residence.
- The second section groups together a set of self-assessment questions on occupational stress according to Légeron (2003). It is composed of 24 items divided into 6 categories identified by the letters P (Work pressure), C (Work changes), F (Professional frustrations), R (Interpersonal relations), V (Professional violence), and E (Work environment). The responses to these items are scored on a 4-point scale (from 0 to 3). The total score indicates the overall level of stress, while the sub-scores make it possible to specifically identify the most stressful factors for the individual (Figure 1).

## I. WORK EVALUATION: IS YOUR WORK STRESSFUL?

	Absolutely true	Somewhat true	Somewhat false	Completely false
P1 The days are too short for all the work I have to do	3	2	1	0
C2 I cannot predict what work I will be doing in a year's time	3	2	1	0
E3 My working environment is pleasant	0	1	2	3
R4 There are too many people around me who have damn characters and are not easy to live with	3	2	1	0
E5 My job requires physical effort or difficult tasks	3	2	1	0
V6 Given the job I do, I could very well be the victim of an assault	3	2	1	0
F7 With all the work I do, I don't really getting anything in return.	3	2	1	0
P8 I often have to juggle several things at once in my work	3	2	1	0
C9 The department where I work is soon to be restructured or relocated	3	2	1	0
F10 I receive more criticism than praise in my work	3	2	1	0
C11 I find it difficult to master new technologies at work (computers, the Internet, etc.)	3	2	1	0
R12 The contacts I have with people at work are a source of satisfaction.	0	1	2	3
P13 In my job, making a mistake could have serious consequences	3	2	1	0
E14 I spend a lot of time travelling commuting (to get to work or because of my job)	3	2	1	0
V15 At work, I sometimes feel afraid and fear for my safety when dealing with certain people	3	2	1	0
F16 I think my company does not care about my career	3	2	1	0
R17 I often come into contact with people who are who are rude or even downright unpleasant	3	2	1	0
C18 My job requires me to constantly adapt constantly to new things	3	2	1	0
V19 I have already been hit or injured while the course of my work	3	2	1	0
P20 I have been given work targets that I find difficult to achieve	3	2	1	0
V21 There is one or several who takes pleasure in making me suffer.	3	2	1	0
E22 I work in a noisy and hectic environment hectic	3	2	1	0
F23 The company I work for offers many benefits	0	1	2	3
R24 There is a bad atmosphere at my workplace	3	2	1	0

Figure 1. Legeron's occupational stress assessment grid.

## 2) Data processing tool

Data are processed using XLSTAT software version 2021. XLSTAT is a computer program that integrates with Microsoft Excel software, in the form of an add-on module, and is dedicated to the statistical processing of data (visualization, statistical tests, modeling, etc.).

## 2.2. Method

### 2.2.1. Sampling

The sampling method chosen in the framework of this study is convenience sampling. This choice is based on the lack of access to an exhaustive directory of all individuals in the study population, that is to say, all the people working in the Abidjan area. Nevertheless, the sample is composed of workers from various professional sectors of Abidjan. These include both employees from the public sector and those from the private sector, with the aim of gathering sufficiently heterogeneous professional profiles and constituting a representative sample of the studied population.

### 2.2.2. Selection Criteria

#### 1) Inclusion criteria

The persons taking part in this study meet the following criteria:

- Be at least 18 years old (adult workers);
- Reside or have a professional activity (formal or informal) in Abidjan;
- Give their consent to participate.

#### 2) Exclusion criteria

The persons excluded from this study exhibit the following characteristics:

- Being a worker on extended leave (sick leave or maternity leave), because their experience of occupational stress at the time of the study may be biased.
- Being under psychiatric medical treatment, because workers undergoing treatment for psychiatric disorders could distort the assessment of stress exclusively related to work.

### 2.2.3. Conduct of the Data Collection

Before the actual survey, a pre-survey phase is carried out with a sample of 15 workers met in Abidjan to test the questionnaire. This test made it possible to revise the questionnaire by making the necessary adjustments. During the actual survey phase, each participant is informed about the purpose, the ethical aspects (anonymity and confidentiality), the benefits, and the implications of the study. With their informed consent, the questionnaire (in paper format) is administered to participants according to two modes:

- Face-to-face: The interviewer conducts the interview with the participants to ensure a uniform understanding of the questions. This method helps minimize biases in understanding the questions, especially among unschooled subjects or those with a low level of education.
- Self-administration: For participants with greater autonomy (executives, office

employees), the questionnaire is given to them with clear explanations of the instructions and deadlines for completing it.

Verification of the collected responses is regularly carried out to correct omissions and inconsistencies.

#### **2.2.4. Data Processing**

##### **1) Processing of scores**

The questionnaire consists of 24 questions on work-related stress. Stress is measured according to two dimensions:

- First, the level of occupational stress is determined by the calculation of the total stress score:
  - If this score is between 0 and 10, the level of stress is very low.
  - If this score is between 11 and 20, the level of stress is low.
  - If this score is between 21 and 30, the level of stress is moderate.
  - If this score is between 31 and 40, the level of stress is high.
  - If this score is higher than 40, the level of stress is considered extreme.
- Second, each of the six (06) stress factors is determined by adding the scores of the corresponding items. For each of these factors, there are four (04) items with the same rating values. The factor that obtained the highest score is considered the most stressful. It is retained for the description of stress factors.

These stress factors and the corresponding items are presented as follows:

- Professional pressures (P): items 1, 8, 13, and 20;
- Professional changes (C): items 2, 9, 11, and 18;
- Professional frustrations received (F): items 7, 10, 16, and 23;
- Professional relations (R): items 4, 12, 17, and 24;
- Professional violence (V): items 6, 15, 19, and 21;
- Professional environment (E): items 3, 5, 14, and 22.

##### **2) Statistical processing**

The method of data processing in this study includes descriptive and inferential analyses. Descriptive statistics are used to analyze the general characteristics of the subjects, stress levels, and associated factors. Statistical tests (Chi<sup>2</sup>, Kruskal-Wallis, and linear regression) were used to examine the associations between stress and the sociodemographic and professional characteristics of the subjects. For the tests used, the statistical significance threshold  $\alpha$  is set at 0.05.

## **3. Results and Discussion**

### **3.1. Results**

#### **3.1.1. Analysis of the Sociodemographic Characteristics of the Subjects**

At the end of data collection, 455 of the 600 questionnaires distributed are retained for analysis, the others being unusable or not filled in. The participation rate in this study is 74.1%. According to the analysis of the general characteristics (**Table 1**), 445 workers from Abidjan participated in the study. These subjects are composed more of men (58.43%) than women (41.57%), which corresponds to a sex

**Table 1.** Description of the subjects according to their general characteristics.

General Characteristics	Number (N = 445)	Percentage (100%)
<b>Sex</b>		
Men	260	58.43%
Women	185	41.57%
<b>Marital status</b>		
Single	257	57.75%
Married	182	40.9%
Divorced	6	1.35%
<b>Age groups</b>		
18 - 26 years	108	24.26%
27 - 34 years	131	29.44%
35 - 40 years	115	25.84%
41 - 50 years	71	16.00%
51 - 60 years	16	3.60%
Over 60 years	4	0.86%
<b>Professional category</b>		
Executive	202	45.39%
Supervisor	118	26.51%
Worker	125	28.08%
<b>Number of dependent children</b>		
0	184	41.35%
1 to 3	200	44.95%
4 to 6	59	13.26%
Over 6	2	0.44%
<b>Place of residence</b>		
Abobo	38	8.54%
Adjamé	17	3.82%
Anyama	5	1.15%
Attécoubé	6	1.35%
Bingerville	33	7.42%
Cocody	220	49.44%
Koumassi	29	6.52%
Marcory	17	3.82%
Plateau	5	1.12%
Port-Bouët	5	1.02%
Songon	1	0.29%
Treichville	10	2.25%
Yopougon	59	13.26%

ratio of 1.4. They are generally single persons, that is, 57.75% of participants ( $n = 257$ ), then persons in a relationship or married ( $n = 182$ ; 49.90%), with divorced persons being the least numerous with a proportion of 1.35% ( $n = 6$ ). Concerning age, the majority of subjects are between 27 and 34 years old with a proportion of 29.44% ( $n = 131$ ). This category is followed by subjects aged 35 to 40 years ( $n = 115$ ; 25.84%) and subjects aged 18 to 26 years ( $n = 108$ ; 24.26%). The least numerous subjects are over 60 years old ( $n = 4$ ; 0.90%). The analysis of professional categories reveals that most subjects are executives, with a proportion of 45.39% ( $n = 202$ ). The other professional categories are workers, with a proportion of 28.08% ( $n = 125$ ), and supervisors, with a proportion of 26.51% ( $n = 118$ ). As for parenthood, the results show that the majority of subjects ( $n = 261$ ; 58.65%) have at least one child. Indeed, 44.95% ( $n = 200$ ) of participants have 1 to 3 dependent children, while 13.26% ( $n = 59$ ) have 4 to 6. Some subjects even have more than 7 dependent children. These represent 0.44% ( $n = 2$ ) of the sample. Finally, for the place of residence, the results

Show that nearly half of the subjects ( $n = 220$ ; 49.44%) live in the commune of Cocody, the other subjects being distributed across the other communes of the district of Abidjan. However, it should be noted that in terms of proportion, after the subjects living in Cocody come those who live in the commune of Yopougon with a proportion of 13.26% ( $n = 59$ ), then the inhabitants of Abobo ( $n = 38$ ; 8.54%).

### 3.1.2. Analysis of the Level of Occupational Stress According to the Sociodemographic Characteristics of the Subjects

The analysis of the level of stress (**Table 2**) shows overall that most of the subjects practice a profession with a high level of stress (36.63%). However, the subjects with an extremely stressful profession are just as important and represent 28.31% of the sample. They are followed by the subjects living in a moderately stressful professional situation with a proportion of 26.31%. Only 7.64% and 0.67% of the subjects describe a low and very low level of stress. According to the Chi<sup>2</sup> proportion test, the differences in observed proportions are statistically significant ( $p = 0.000$ ).

**Table 2.** Description of subjects according to the level of overall stress.

Overall level of stress	Frequency	Percentage	Chi <sup>2</sup> test
Very low	3	0.67%	$p = 0.000^*$
Low	34	7.64%	
Moderate	119	26.74%	
High	163	36.63%	
Extreme	126	28.31%	
<b>Total</b>	<b>445</b>	<b>100%</b>	

\*The differences in proportions are statistically significant (Chi<sup>2</sup> test,  $p < 0.05$ ).

Concerning the level of stress according to the professional category (**Table 3**), the results show that among most executives, the level of occupational stress is high ( $n = 70$ ; 34.65%). Among workers, professional activities are generally extremely stressful ( $n = 51$ ; 40.80%). As for supervisors, in most cases they are in a professional situation with a high level of stress ( $n = 49$ ; 41.53%). Moreover, according to the Chi-square independence test applied to the observed results, the level of stress and the professional category are related ( $p = 0.002$ ).

**Table 3.** Description of the level of stress of the subjects according to their sociodemographic characteristics.

General characteristics	Stress level										<i>Ch<sup>2</sup>/Fisher exact</i> <i>p</i>
	Very low		Low		Medium		High		Extreme		
	n	%	n	%	n	%	n	%	n	%	
Professional category											
Supervisor	1	0.22	11	2.47	24	5.39	49	11.01	33	7.42	
Executive	2	0.45	17	3.82	71	15.96	70	15.73	42	9.44	0.002*
Worker	0	0.00	6	1.35	24	5.39	44	9.89	51	11.46	
Sex											
Women	1	0.22	10	2.25	64	14.38	66	14.83	44	9.89	0.001*
Men	2	0.45	24	5.39	55	12.36	97	21.80	82	18.43	
Number of dependent children											
0	2	0.45	9	2.02	39	8.76	69	15.51	65	14.61	
1 - 3	0	0.00	16	3.60	64	14.38	73	16.40	47	10.56	0.031*
4 - 6	1	0.22	9	2.02	15	3.37	20	4.49	14	3.15	
More than 6	0	0.00	0	0.00	1	0.22	1	0.22	0	0.00	

Taking into account sex, the results of the analysis of the level of stress show that men live in a slightly more marked professional situation compared to women. Indeed, the majority of the latter are highly stressed by their work ( $n = 66$ ; 35.68%). Men, on the other hand, generally find that the stress experienced in the context of their profession is also high ( $n = 97$ ; 37.31%). According to the Chi-square independence test, the observed level of stress is related to sex ( $p = 0.001$ ).

Finally, when considering the level of stress according to the number of dependent children, the results show that, regardless of the number of children, the subjects generally find that their work presents a high level of stress. Indeed, this level of stress is observed in 69 subjects without dependent children (37.50%), 73 subjects with one to three children (36.50%), and 20 subjects with four to six children (33.90%). Moreover, according to Fisher's exact test, the level is related to the observed parental category ( $p = 0.031$ ).

### 3.1.3. Analysis of Work-Related Stress Factors

The overall analysis of stress factors (Table 4) shows that the stress generated is significant regardless of the factor considered ( $p = 0.000$ ). Moreover, there is no significant difference between these factors, as evidenced by the significance indices. However, professional pressures seem more decisive with a score of 2980. This factor is followed by frustrations and professional changes with respective scores of 2720 and 2714. Relationships, violence, and professional environment come last with respective scores of 2444, 2367, and 2395.

**Table 4.** Description of subjects according to the overall scores of stress factors.

Stress factors	Overall score	Equation	Correlation coefficient	Significance index
Pressure	2980	$y = 2.7568x + 16.2484$	$r^2 = 0.48$	***
Frustration	2720	$y = 2.2653x + 21.1472$	$r^2 = 0.38$	***
Change	2714	$y = 1.6773x + 24.0391$	$r^2 = 0.27$	***
Relationship	2444	$y = 2.3666x + 21.0922$	$r^2 = 0.34$	***
Violence	2367	$y = 1.9532x + 24.5332$	$r^2 = 0.36$	***
Environment	2395	$y = 1.9718x + 24.2585$	$r^2 = 0.33$	***

Depending on the professional category, the analysis of stress factors (Table 5) shows that among executives, professional frustrations constitute the main stress factor, with a score of  $852 \pm 18.74$ . Supervisors are mostly stressed by work pressure, which represents a score of  $1204 \pm 51.12$ . Among workers, the mainly observed stress factor is the change of position and/or of supervisors, corresponding to a score of  $1036 \pm 35.21$ . According to a combination of the Chi<sup>2</sup> independence test and the ANOVA by professional category, the stress factor is related to the professional category.

**Table 5.** Description of stress scores according to associated factors and professional category.

Stress factors	Professional category			Chi <sup>2</sup> test
	Executives	Supervisors	Workers	
Pressure	$756 \pm 32.01$	$1204 \pm 51.12$	$1020 \pm 26.34$	
Change	$764 \pm 18.46$	$914 \pm 41.15$	$1036 \pm 35.21$	
Frustration	$852 \pm 18.74$	$836 \pm 31.22$	$1032 \pm 24.48$	$p = 0.011^*$
Relation	$740 \pm 33.67$	$733 \pm 18.71$	$971 \pm 21.65$	
Violence	$710 \pm 17.15$	$722 \pm 20.39$	$935 \pm 18.17$	
Environment	$735 \pm 9.12$	$645 \pm 11.54$	$1015 \pm 55.43$	
Kruskal-Wallis test	$p = 0.021^*$	$p = 0.017^*$	$p = 0.038^*$	

## 3.2. Discussion

The present study examines the prevalence of occupational stress and the factors associated with it among workers from various sectors of activity in the district of Abidjan. The discussion of the results obtained is structured around three main axes: the sociodemographic characteristics of the subjects, the prevalence of occupational stress within the study population, and the main stress factors identified.

### 3.2.1. Sociodemographic Characteristics of the Subjects

The analysis of the sociodemographic characteristics of the subjects shows a high participation rate (74.1%), reflecting the marked interest of workers in the theme studied (occupational stress). This finding is consistent with the observations of [Ndiaye and Lo Sarr \(2015\)](#) in Dakar among hospital staff, and of [Kan and Yu \(2016\)](#) in China among employees in the banking sector, who also reported strong involvement of subjects in studies on occupational stress. However, the rate obtained remains lower than that reported by [Niedhammer et al. \(2007\)](#) in France (96.5%), whose methodology, based on the mandatory distribution of questionnaires during medical visits, mechanically favored an almost total participation. Conversely, the participation rate of the present study is higher than those reported by [Bruchon-Schweitzer and Boujut \(2014\)](#) in Morocco (71.9%) and by [Fournel et al. \(2008\)](#) in France (68%), thus confirming the importance given to this issue by Ivorian workers.

Concerning the sex distribution, the results indicate that men (58.4%) are more represented than women (41.6%), with a sex ratio of 1.4. This male predominance could be attributed to the strong presence of workers and supervisors, professions traditionally dominated by men. The average age of the subjects is 38 years, which reflects a young and active population. These data are consistent with those of [Ager et al. \(2012\)](#), who also describe a predominantly young and active profile through a study conducted in northern Uganda.

The analysis of marital status shows a predominance of single people (57.8%), followed by married people (40.9%). These results, however, differ from those observed by [Ager et al. \(2012\)](#), where national workers were mostly married. This divergence can be explained by cultural and social factors specific to the Ivorian context, where a significant part of young workers prioritizes professional stability before marriage.

The geographical distribution highlights a strong concentration of workers in the commune of Cocody (49.4%), followed by Yopougon (13.3%) and Abobo (8.5%). This distribution reflects both the economic, administrative, and residential attractiveness of Cocody and Yopougon ([Koffi et al. 2023](#)), but also the importance of certain industrial areas, particularly in Yopougon ([Fokou et al., 2016](#)). Finally, the predominance of executives (45.4%) in the sample can be attributed to the strong representation of workers from the administrative and private sectors, mainly located in these communes.

The discussion of the sociodemographic characteristics of the participants thus highlights a young, active, and predominantly male sample, whose diversity of

professional profiles reflects well the structure of the labor market in Abidjan. These specificities make it possible to better understand the distribution of stress levels observed in the population and introduce, as a second step, the discussion on the prevalence of occupational stress within the studied sample.

### 3.2.2. Prevalence of Occupational Stress within the Study Population

The analysis of the level of occupational stress reveals that more than one third of the subjects (36.63%) present high stress, while 28.31% report extreme stress and 26.31% moderate stress. Low or very low levels are in the minority, with respective rates of 7.64% and 0.67%. These results reflect a concerning prevalence of occupational stress among the workers of Abidjan, where nearly two-thirds of the studied population fall into the categories of high or extreme stress.

These observations are consistent with those reported by [Kandi and Tügen \(2020\)](#), who noted stress levels ranging from moderate to very high in 84.4% of the executives surveyed in Algeria, and by [Gayou et al. \(2016\)](#), who emphasized that more than 56% of employees perceive work stress as a frequent reality. Similarly, [Olatona et al. \(2014\)](#) in Nigeria showed that 67% of bankers present moderate stress, while 24.7% suffer from excessive stress. In Côte d'Ivoire, [Aka et al. \(2018\)](#) revealed in a port company in Abidjan a high prevalence of occupational stress, concerning 54.6% of employees, mainly related to work overload, deficient organization, and pressure exerted by the hierarchy, which corroborates the present results and confirms the magnitude of the phenomenon in the Ivorian context.

The differential analysis according to professional status highlights that workers and supervisors are significantly more exposed to high levels of stress than senior executives. This trend is consistent with the conclusions of [Traore et al. \(2020\)](#) in a railway company in Burkina Faso and [Adjobimey et al. \(2022\)](#) in Benin, where employees in subordinate positions experience more stress than managers. [Vaillant and Wolff \(2010\)](#) provide an explanation for these findings by suggesting that managers, benefiting from higher remuneration and better quality of life, probably have compensatory resources that limit their exposure to stress.

However, unlike the results obtained by [Kelly et al. \(2007\)](#) and [Henze et al. \(2021\)](#), our study does not reveal any significant difference between sexes. This absence of correlation can be interpreted through the works of [Fida et al. \(2023\)](#), who suggest that stress profiles may be similar between men and women, despite a slightly higher probability of belonging to a low-stress profile among the latter. Moreover, [Kerr et al. \(2020\)](#) show that gender roles may play a protective role in the perception and management of stress, explaining the absence of significant disparity between men and women in our sample.

Finally, the relationship between parenthood and occupational stress highlights that workers without children appear more stressed than those with offspring. This result diverges from the observations of [Bekker et al. \(2000\)](#) and [Chen et al. \(2022\)](#), who rather associate the reconciliation between family life and profes-

sional life with an additional source of stress. In our context, this trend could be attributed to the role of social support. Indeed, workers with children benefit from a network of emotional and practical support that reduces the impact of work-related stress (Wang et al., 2017; Robinson & Weiss, 2020).

In short, the identification of high proportions of workers presenting moderate to extreme stress reveals that this problem constitutes a major occupational health issue. In the last stage of the discussion, it is therefore appropriate to understand the factors that fuel this stress in order to shed light on possible prevention strategies.

### 3.2.3. Occupational Stress Factors

The results of the present research indicate that the predominant stress factors among workers in Abidjan are professional pressure and frustration. These two dimensions are distributed differently according to professional status. Indeed, frustration dominates among executives and workers, while pressure is particularly marked among supervisors.

Professional frustration is a central determinant, as already observed by Tessier (2006), who identifies frustration as the main stress factor among managers, mainly due to a lack of recognition and consideration. In the Ivorian context, the frustration of executives can be associated with the absence of promotion prospects and career stagnation, while that of workers results more from work overload and interpersonal conflicts. Indeed, Sassi et al. (2015) state that overload and role ambiguity constitute key mediators between stress factors and emotional exhaustion. Furthermore, Hahn (2000) and Didona and Pell (2019) show that relational conflicts significantly reinforce the perception of stress, particularly among workers with high negative affectivity or an external locus of control.

Professional pressure, defined as the feeling of not being able to achieve the set objectives, constitutes another major stress factor. In the present work, it is mainly observed among supervisors, who are forced to ensure both productivity and supervision. On the neurophysiological level, this pressure activates a cascade of responses involving the release of noradrenaline and cortisol, hormones responsible for the increase in blood pressure and heart rate (McGee et al., 2023; Savic, 2013). When this process becomes chronic, it exposes individuals to serious pathologies such as cardiovascular diseases and diabetes (Lupien et al., 2018; Bezrukova & Mikerov, 2022). A worker subjected to tight deadlines may thus develop a persistent secretion of cortisol, which durably alters his physical and mental health (Savic, 2013).

At the organizational level, the impact of pressure on performance is also documented. For example, Zhang et al. (2021) and Alalhareth et al. (2024) report that stress reduces professional performance by about 75% and contributes to 50% of absenteeism in companies. This finding highlights the seriousness of the problem in modern professional environments.

Finally, in the African context, the available data confirm that difficult working conditions exacerbate this phenomenon. Dawood et al. (2022), in a survey con-

ducted among doctors and nurses in the public sector in KwaZulu-Natal in South Africa, reveal that 44.3% of participants present symptoms of stress, 51.5% show signs of depression, and 47.2% show anxiety, of which 16% are in the “severe or extremely severe” category. Similarly, [Cohen and Venter \(2020\)](#) observe that nurses in Johannesburg experience significant chronic stress linked to work overload, lack of material resources, as well as family pressure and high social expectations.

#### 4. Conclusion

The present study analyzed the prevalence of occupational stress and the key associated factors among workers in the city of Abidjan. The results reveal that a majority of participants, more than two-thirds, suffer from high or extreme stress, confirming that this scourge represents a concerning issue in the urban context in Côte d’Ivoire. The results also show that workers and supervisors are the most vulnerable categories, whereas the impact on executives is relatively lower. Moreover, the main factors of stress experienced by workers seem to be professional constraints, feelings of dissatisfaction, and changes in organization. These results are in agreement with African and international works that highlight the significant exposure of lower-ranking workers to organizational constraints and unstable working conditions. They also underline the importance of structural and contextual factors in the emergence of occupational stress. On the neurophysiological level, prolonged exposure to these stresses can provoke sustained stimulation of the HPA axis, which could lead to cognitive and emotional disorders that may harm work performance and the health of individuals. On the operational level, these observations highlight the necessity of establishing preventive and corrective strategies adapted to the Ivorian reality. This notably implies reducing excessive workloads, improving interpersonal relations, providing support during organizational changes, and setting up psychological assistance programs. These actions would contribute not only to fostering the well-being of workers but also to increasing the productivity of companies and institutions. Finally, this study emphasizes the necessity of conducting additional research that integrates biological and psychosocial parameters, in order to deepen our understanding of the mechanisms of occupational stress and to design more effective preventive public policies in developing countries, such as Côte d’Ivoire.

#### Authors’ Contributions

Kakou Luc GBALOU: Conceptualization, Methodology, Validation;

Paterson Valery DISSEKA: Methodology, Investigation, Data curation, Formal analysis, Writing—original draft;

Niemtieh OUATTARA: Investigation, Software, Formal analysis, Writing—review & editing;

Némé Antoine TAKO: Supervision, Validation;

Léon GLIN: Project administration.

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## Conflicts of Interest

The authors declare that they have no conflict of interest in relation to the present study.

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