

Occupational stress and its consequences on workers' health in Algeria: Case of a sample of workers from the wilaya of Bejaia

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Abstract: Occupational stress is the most dangerous psychosocial risk in the workplace because of its repercussions on workers' health. Good working conditions enable workers to maintain physical and moral well-being, reduce absenteeism and increase productivity. The aim of this article is to verify the impact of occupational stress on workers' health in Algeria through a survey in the wilaya of Bejaia. The results of this study confirm that occupational stress is widespread among Algerian workers, where it is responsible for a number of physical and psychological pathologies. We found that the risk is worrying and requires a rigorous preventive approach.

Keywords: Professional stress, physical pathologies, psychological pathologies, prevention, Bejaia.

1. Introduction

The term "stress" is very common in the workplace. Occupational stress is a complex process whereby the human organism adopts a strategy for adjusting to conditions that disrupt the proper performance of its tasks. Good working conditions enable workers to maintain physical and moral well-being, reduce absenteeism and increase productivity. However, when work situations are stressful over a long period of time, they can damage their biological balance and cause physical and mental illness, which generates economic costs for workers (absenteeism, medical care costs, depression, smoking, alcohol, etc.) and for the company (lost working days, reduced production, lower work performance, etc.). Knowing the risks and consequences of occupational stress enables us to assess the extent of the problem, implement preventive action plans and take steps to improve organization and quality of life at work. According to the ILO, "The prevention of stress at work must therefore be based on clear policies and strategies to promote decent work" (ILO, 2013).

Occupational stress is very much a part of today's society, and is linked to lifestyle, sedentary lifestyles and the work environment. Its perception differs from one person to another, depending on their ability to adapt to stressful situations. The aim of this study is to assess the impact of stress on workers'

health, based on a sample from the wilaya of Bejaia. In an attempt to answer the following question: What are the pathologies caused by occupational stress among workers in the wilaya of Bejaia?

In order to provide some answers to this question, we based ourselves on the following hypotheses:

Hypothesis 01: "Occupational stress is highly prevalent among workers in the wilaya of Bejaia, but very poorly identified as a factor triggering somatic diseases, which amplifies these negative externalities".

Hypothesis 02: "The underestimation of the adverse effects of stress on workers' health reduces companies' interest in its prevention, making workers highly vulnerable to stress".

In order to explore the socio-economic effects of occupational stress on workers, we had to carry out a bibliographical search of books, articles and websites. In addition, we carried out a questionnaire survey of a sample of 1,538 workers in the wilaya of Bejaia in 2021.

This article will first present the conceptual framework of occupational stress, then focus on its effects on workers' health. Finally, the results of a survey of workers in the wilaya of Bejaia on the effect of stress on their health will be presented.

2. Method

2.1. Literature review

Stress is the most studied psychosocial risk, as it is listed as the most dangerous in the workplace due to its multidimensional nature and multiple repercussions on workers' health (Albert & Saunder, 2010).

Definitions are many and varied, but the most widely used is that proposed by the European Agency for Safety and Health at Work: "Stress occurs when there is an imbalance between a person's perception of the constraints imposed on him by his environment and his perception of his own resources for coping with them. Although the process of evaluating constraints and resources is a psychological one, the effects of stress are not solely psychological. They also affect physical health, well-being and productivity" (INRS, 2013). According to this definition, the AESST focuses on three important concepts: the stressors, the person, and the effects of stress on the person's attitudes and health. According to the WHO report, Work Organization and Stress, "work-related stress is the set of reactions that employees may have when confronted with work demands and pressures that do not correspond to their knowledge and abilities and that call into question their ability to cope with them" (WHO, 2004).

The French National Institute of Health and Medical Research considers stress to be an adaptive response that allows the body to manage threatening stimuli (INSERM, 2011). These responses require the intervention of the entire central and peripheral nervous system and activate adaptive survival functions, then ensuring a return to homeostatic equilibrium. The study published in 2010 by Eurogip reminds us that "the term stress is used in two lexical terms: it refers both to stressors and to stress itself, the set of reactions of an individual subjected to stressors" (Gintrac, 2011).

According to the European Trade Union Confederation "stress is not a disease, but prolonged exposure to stress can reduce efficiency at work and can cause health problems" (ETUC, 2005). However, this definition did not take into account chronic stress, where the individual is likely to have major complications when exposed to intense pressure for a long time. More specifically, Lazarus and

Folkman define stress as "a particular transaction between an individual and a situation in which it is assessed as overwhelming their resources and potentially endangering their well-being" (LEM, 2008). It should be noted that these resources can be both personal and professional.

As for Jean Garneau, he gives the following definition: "Stress is the state of chronic tension, physical and psychological, which results from an inadequate way of managing psychological pressure for a prolonged period of time" (Billet, 2006). At the psychological level, stress results in a brief exacerbation of alertness and emotional state that leads to psychomotor agitation or inhibition. When this reaction is intense, long-lasting, or chronic, it is accompanied by suffering and is likely to lead to health problems. These responses can be physiological, behavioral, cognitive, alone or combined.

2.1.1. Impact of occupational stress on employees' physical and mental health

Occupational stress can cause a "multitude of pathologies" (FEACVT, 1995) infecting workers' health, the effects of stress can take many forms, "stress can have consequences on almost all aspects of health. Stress can result in a wide variety of disorders, malaise" (Leruse et al., 2004).

The impact of stressors can take the form of physiological and psychological illnesses, and for some people can lead to depression and suicide in the workplace. According to the European Foundation for the Improvement of Living and Working Conditions, the effects of chronic stress on health are: organic disorders, muscle symptoms such as tension and pain, disorders of the digestive system, symptoms that affect the circulatory system, problems of the respiratory system, disorders of the central nervous system and sexual problems (FEACVT, 1995). These symptoms result in high costs to the community, significant reductions in hours of work and productivity. According to Amar P, Angel P, Gava M-J and Vaudolon, "Stress symptoms signify the failure of an organism to adapt to harmful stimuli.

The individual responds with a variety of reactions, which can be physiological, emotional, psychological, and behavioral" (Amar, Angel, Gava, &Vaudolon, 2010). According to Gaussin, Karnas and Sporcq, "stress can be the origin of simple disorders or certain diseases, and its effects on health take many forms" (Rouat, 2010). Taking the example of the "Sumer 2003 study", 61% of European employees have a high-stress job and 27% complain of health problems related to a high-stress job (Baggio, Loyer, Merck, & Sutter, 2009). These conclusions are confirmed by studies by the European Agency for Safety and Health at Work (AESST, 2006).

Recent studies on the links between stress and organic and physical health" (AESST, 2006) began in the 20s and 30s taking into account the research of Cannon (1929, 1931) and Selye (1936), followed by the work of (Landsbergis 1995, Meijmane 1995, Kawakami and Haratani 1999). The most common and most studied pathologies are presented as follows:

A. Musculoskeletal disorders (MSDs): Physical and psychological factors linked to occupational stress are known to strongly influence the onset of MSDs (Xavier, Patrice, & all, 2009), which often manifest themselves through repetitive activity or gesture. Researchers Kuorinka and Koskinen have stated that "the quantity of work correlates with reports of musculoskeletal problems" (Carayon, et al., 1995). Further research has been carried out to determine the "psychosomatic aspect of MSDs" and the importance of the psychological aspect (Conne-Pettéard, Glardon, Parrat, &Ussel, 2001).

B. Burnout or burnout syndrome: Veniga and Spradley, (1981) define burnout as "a depressing psychological state caused by unrelieved work stress" (Stranks, 2005). Cherniss, (1980) describes it as "a

three-phase process" (Berclaz, 2013) involving in the first place an imbalance between individual and organizational resources in relation to the demands of work. For Bruchon-Schweitzer and Rasclé, burnout is perceived "as a set of responses; emotional, cognitive, physiological and behavioural stress, to chronic occupational stress (Cherkaoui et al, 2012)". Burnout is a possible response of the individual who must continually adapt to his or her work environment. It is also referred to as "erosion of the human mind" which results from prolonged exposure to high levels of stress at work (Baron, 1986). Emont P, Grésy J-E, Pérez-Nukhel R. note that burnout manifests itself as chronic stress that exhausts the individual to his or her last resources. This is why it is found in the medical nomenclature under the name of "burnout syndrome" (Emont, Grésy, & Pérez-Nukhel, 2012). According to the same authors, in Japan, since the 1960s, the phenomenon of death by overwork or sudden heart attack has been associated with nervous exhaustion (Karôshi). In July 2007, another INRS researcher pointed out in an article in *Libération* that "157 people died of this syndrome in Japan in 2005-2006" (Steiler, 2010).

C. Cardiovascular diseases: According to the European Agency for Safety and Health at Work, "the relationship between occupational stress and the risk of cardiovascular accident is very real" (AESST, 2006): an increased risk of coronary heart disease and even death exists in employees confronted with strong psychological pressure in their professional activity. These diseases are multifactorial, but factors due to work and stress are clearly involved.

According to Bounhoure J-P, "Several epidemiological studies provide arguments in favor of the role of chronic stress in the onset of atherosclerosis. In 2006, a meta-analysis of 14 prospective studies examined the impact of various types of work stress on the risk of ischemic heart disease. All studies suggest a 50% increase in the risk of atherosclerosis in stressed subjects" (Bounhoure, 2010). The same author proves that severe arrhythmias, tachycardias, or ventricular fibrillations cause sudden death. In a study of 1,600 Swedes, "heart problems" (FEACVT, 1995) were the most common, with 20% describing their work as both psychologically demanding and at the same time leaving very little initiative.

D. High blood pressure: This is a widespread pathological manifestation in which stress plays a role "(Brod 1971, Weiner 1979, Obrist 1981, Weiss, Herd and Fox, 1981, Svensson 1983)" (ILO, 1984). "Chronic stress increases the risk of high blood pressure. This is related to the effect of neurotransmitters (which increase the force of myocardial contraction and constricts vessels) and hormones (cortisol and aldosterone retain salt, and thus increase blood volume) (Baggio, Loyer, Merck, & Sutter, 2009)."

According to the ILO, "occupational stress is also likely to contribute to higher blood pressure levels. Numerous studies have shown that this phenomenon is particularly prevalent among switchboard operators and teachers" (ILO, 1984). For the authors Askenazy P and all; "The etiological mechanisms that may explain the association between psychosocial factors and health indicators relate to the effects of psychosocial stressors. These lead to an increase in the secretion of certain hormones, or an increase in blood pressure" (Askenazy, 2011).

A 1988 study related chronic stress to hypertension "It included 127 outpatients and inpatients, from a stress treatment program, and 129 normal people. After three days of hospitalization, there was a 17.3% incidence of hypertension in hospitalized patients in the stressed group with a 5% to 13% incidence of hypertension in the normal group" (Frohlich, Hooway, & Hudzinski, 1988).

E. Low back pain: Chronic stress can increase the prevalence of this condition. According to INSERM, "there are few studies that have focused on the psychosocial factors of work in relation to low back pain and most of them are cross-sectional studies that do not take into account the temporal sequence between exposure to the various factors and the onset of spinal pain" (INSERM, 2000). A survey carried out in Switzerland showed this link. According to "this study of certain groups of workers belonging to 8 companies has highlighted two distinct but entangled processes of chronicization of low back pain" (Conne-Pettéard, Glardon, Parrat, & Usel, 2001).

On the one hand, physical wear and tear is directly related to the duration and intensity of professional constraints. On the other hand, there is a psychosocial aspect related to the representations that individuals develop about their possibilities to transform their environment and their state of health.

2.1.2. Psychological pathologies

Stress is a source of very complex psychological illnesses. According to Albert E; and Saunder F, "it is a risk factor for various diseases, including anxiety and depression" (Albert & Saunder, 2010). Beyond a certain level of stress, the probability of triggering one of these pathologies increases. Thus, according to Servant D, "some workers are at risk because of the existence of a psychological vulnerability that the stress factor triggers and aggravates" (Servant, 2007).

A. Anxiety: Anxiety can be an unpleasant temporary emotional state (anxiety state) or a more stable personality trait, not directly related to an external event (anxiety trait) (Steiler, 2010). It manifests itself in a feeling of anguish, tension, uneasiness, terror in the face of a peril of an indeterminate nature. Anxiety pushed to its peak is the source of an evil that is spreading more and more in companies. The pathological effect of anxiety "... results in physical tension associated with perceptions of fear, excessive worry, and sometimes takes the form of anxiety attacks. Behaviorally, it manifests itself as inhibitions, avoidance of anxiety-provoking situations, and ineffective hyperactivity. It can also lead to intellectual blockages" (Lefebvre & Poirot, 2011).

B. Depression: It manifests itself as a pathological situation with a sad and painful mood adjusted to a decrease in psychological and physical effort. Depression is defined as "a condition associating, for at least two weeks, sadness, loss of desire, pleasure, eating disorders, and a negative self-view. It induces physical and intellectual slowdown, a source of fatigue and discouragement, as well as sleep disorders" (Lefebvre & Poirot, 2011). "Depressive disorders are closely linked to the rise of stress and anxiety" (Emont, Grésy, & Pérez-Nukhel, 2012). The WHO has classified depression as one of the three diseases that most degrade people's lives; It leads to a real detachment of the individual who very quickly isolates himself and finds himself vulnerable. According to Grebot É, the proportion of depressive illnesses attributable to occupational stress is high: "it affects 7.5% to 10% of men and 6.1% to 8.3% of women" (Grebot, 2008).

High psychological demands at work, combined with low social support from colleagues or superiors, are predictors of depression.

2.2. Designing and carrying out the field survey

In Algeria, the national statistics available to the National Social Insurance Fund (CNAS) do not provide reliable information on the subject we are dealing with, particularly on the consequences of

occupational stress. As a result, it was necessary to carry out a field survey to collect the information sought in the companies.

The survey conducted in the wilaya of Bejaia was conducted during the period from February 2021 to June 2021. By extending our study to a fairly large sample, we carried out a questionnaire supported by the criteria provided by the CNAS of Bejaia as well as by some guidelines given by occupational physicians of the University Hospital Center "CHU" of Bejaia. Our survey covered 1538 workers from several occupational categories and different geographical locations, including all industrial zones and public administrations, mainly in Bejaia. The representativeness of the sample is based on the quota method: 1% of all workers insured with the CNAS in Bejaia in 2021. On the other hand, the criterion of sector of activity (public and private) and the other criteria (age, sex, occupational category, geographical area) are arbitrary. The aim of the survey was to explain the pathologies generated by occupational stress.

3. Findings and Discussions

3.1. Health problems related to occupational stress

Chronic stress is a risk factor for many health problems. Chronic stress is characterized by both physical and mental symptoms. It is essential to determine the proportion of workers exposed to occupational stress. The majority of workers, a rate of (82%) confirm being stressed by work, including 14% on a daily basis. A large scale of the phenomenon that will cause psychosomatic disorders in workers.

Prolonged exposure of the individual to socio-professional constraints may cause certain diseases. The stress response can become harmful if activated at a very high level, if it is repeated, or if it is chronic, pushing our biological and psychological reactions to their extremes. The following table is a description of health problems related to occupational stress, cross-referenced with the perception or non-perception of occupational stress.

Table 1: Occupational Stress-Related Health Problems

		Health problems related to occupational stress				Total
		No		Yes		
		<i>Frequency</i>	<i>In %</i>	<i>Frequency</i>	<i>In %</i>	<i>Frequency</i>
Perception of Occupational Stress	No	267	95,7	12	4,3	279
	Sometimes	651	89,8	74	10,2	725
	Often	260	80,7	62	19,3	322
	Very often	143	67,5	69	32,5	212
Total		1321	85,89	217	14,11	1538

Source: Table compiled by us using data from the personal survey 2021

The results of the survey reveal that the number of people who say they have health problems due to occupational stress amounts to 205 people out of 1538 people, or 13.33%. Those who are "stressed very often" are 69/212 people affected by one or more diseases related to occupational stress, i.e. a percentage of 32.5%. In general, 8.5% of the sample of workers who often or very often perceive occupational stress developed one or more psychosomatic disorders.

3.2. Occupational stress-related pathologies by type of illness

Chronic stress depletes the body's resources and ability to react and consequently has several pathological consequences.

3.2.1. Cardiac Pathologies

Table 2: Cardiac pathologies linked to professional stress

		Perception of professional stress			
		No	Sometimes	Often	Veryoften
Cardiac pathologies	None	279	720	314	204
	Sometimes	0	4	4	8
	Often	0	1	3	0
	Veryoften	0	0	1	0

Source: Table produced by us using personal survey data 2021

Metabolic disorders include cardiovascular diseases, including heart rhythm disorders and myocardial infarction. Stress can cause heart problems, especially if they occur in someone who is already exhausted. These diseases occur at different degrees of stress and particularly when it is chronic.

As for our investigation, the total number of people affected by this disease amounts to 21 among the entire population studied, implicating professional stress in the development of these cardiac pathologies. We identified 3 workers who experience acute stress characterized by an increased risk of chronic heart disease. Only one person reported having a more serious case characterized by chronic stress and chronic heart problems.

3.2.2. High blood pressure problems

High blood pressure is very common and even unavoidable in a stressful environment.

Table 3: High blood pressure problems linked to work stress

		Perception of professional stress			
		No	Sometimes	Often	Veryoften
High blood pressure problems	None	277	707	302	182
	Sometimes	2	14	11	18
	Often	0	3	7	8
	Veryoften	0	1	2	4

Source: Table produced by us using personal survey data 2021

For subjects exposed to persistent stress, an increase in blood pressure is generally observed. In our study, out of 1538 subjects questioned, 70 declared being hypertensive. These results tell us that a

majority of hypertensives think that it is stress which is the cause of these problems, and 4 people think that their case is serious because of chronic stress with chronic hypertension.

3.2.3. Joint and muscle pain (TMS)

The risks of exposure to chronic stress contribute indirectly to the occurrence of musculoskeletal disorders.

Table 4:Joint and muscle pain related to work stress

		Perception of professional stress			
		No	Sometimes	Often	Veryoften
Joint and muscle pain (TMS)	None	272	686	294	164
	Sometimes	6	28	13	19
	Often	1	8	12	20
	Veryoften	0	3	3	8

Source: Table produced by us using personal survey data 2021

Analyzing the results of the survey, the total number of people affected by muscular and joint disorders is around 121 out of 1538. We also note that when a worker is stressed very often, the risk of exposing themselves to these disorders is all the more frequent.

3.2.4. Lower back pain (lower back pain and sciatica)

In the European Foundation for the Improvement of Living and Working Conditions survey in 1997, the most commonly reported work-related health problem was back pain.(INSERM, 2000).

Table 5:Low back pain linked to professional stress

		Perception of professional stress			
		No	Sometimes	Often	veryoften
Lower back pain (lower back pain and sciatica)	None	271	687	293	167
	Sometimes	6	22	10	15
	Often	2	14	10	19
	Veryoften	0	2	9	11

Source: Table produced by us using personal survey data 2021

Data from our survey show that lower back pain is more common among stressed workers. The total number of people reporting low back pain is 120 cases out of 1538. Most workers say they feel back pain.

3.2.5. Digestive disorders

The digestive system is greatly affected by stress (combined effects of catecholamines and cortisol). Stress mobilizes all brain activity to deal with the situation, to the detriment of the body's other activities. While bowel emptying is slowed by reduced activity of the vagus nerve, the nerve that controls the bladder and rectum remains active, which explains diarrhea, urinary urgency accompanied by bloating, indigestion and so on. In the long term, chronic stress can lead to numerous gastrointestinal complications, aggravating existing conditions such as inflammatory bowel disease (IBD), irritable bowel syndrome, gastro-oesophageal reflux disease (GERD) and peptic ulcers (Lepage, 2023).

Numerous studies show that stress can cause attacks and digestive disorders. Regular exposure to stressful events is associated with symptoms linked to these disorders.

Table 6: Digestive disorders linked to professional stress

		Perception of professional stress			
		No	Sometimes	Often	Veryoften
Digestive disorders	None	278	691	289	165
	Sometimes	1	27	17	21
	Often	0	6	10	18
	Veryoften	0	1	6	8

Source: Table produced by us using personal survey data 2021

According to the survey, the number of these disorders is 115 out of 1538. The main attacks and damage mainly occur in the stomach, colon and intestine. The alteration in the functioning of these organs results in the appearance of more or less invasive disorders: heartburn, ulcers and irritable bowel syndrome.

3.2.6. Anxiety disorders and depression

Yarcheski and Mahon's study highlighted the relationship between perceived stress and depression. According to their results, "stress and anxiety have a direct effect on depression" (Bellinghausen, 2007). In our survey, there were 57 cases out of the entire study population of workers who reported anxiety and/or depression disorders. The largest fraction is all of those who felt they were experiencing chronic stress.

Table 7: Anxiety disorders and depression linked to work stress

		Perception of professional stress			
		No	Sometimes	Often	Veryoften
Anxiety disorders and depression	None	279	708	304	190
	Sometimes	0	12	11	13
	Often	0	3	4	6
	Veryoften	0	2	3	3

Source: Table produced by us using personal survey data 2021

We find that chronic stress leads to anxiety and depressive disorders in 57 of the workers. These reactions will have repercussions on the health balance and the appearance of diseases.

From the above, we conclude that professional stress is responsible for several physical and mental illnesses. Leading to a deterioration in the health of workers and a drop in their productivity.

3.3. Prevention in the professional environment

The prevention of occupational risks means all collective or individual actions which avoid the appearance of a danger linked to the work carried out or its environment, or reduce its impacts. Occupational illness always results from causes linked to technical, human, organizational risk factors or the joint incidence of these often multiple and interdependent factors.

The prevention of occupational stress is not fully adopted by companies, given that stress is not recognized as an occupational illness. This limits the field of intervention to the prevention of pathologies caused by stress. Preventing professional stress really comes down to reviewing managerial and organizational dysfunctions in companies in order to redefine everyone's tasks and reduce conflicts at work.

Table 8: Prevention of pathologies linked to professional stress

		Effective	In %
Recourse to the occupational doctor and/or the occupational psychologist	No	1413	91.9%
	Yes	125	8.1%
	Total	1538	100.0%

Source: Table produced by us using personal survey data 2021

Prevention of illnesses caused by occupational stress is demonstrated by regular visits to occupational health services. However, although these visits constitute a right, only 8.1% use them. This makes workers very vulnerable to professional stress and its consequences.

Conclusion

Professional stress is a current, vast and ambiguous subject. Indeed, occupational stress is a very common phenomenon in today's society, and is a complex process whereby the human organism adopts a strategy of adjustment to conditions that disrupt the smooth running of its tasks. Good working conditions enable workers to maintain physical and moral well-being, reduce absenteeism and increase productivity. It's a highly complex process for the human organism to adopt a strategy for adjusting the tasks to be performed. Indeed, the impact of stress factors can take the form of physiological and psychological illnesses, and for some people can lead to depression and suicide in the workplace. According to the European Foundation for the Improvement of Living and Working Conditions, the effects of chronic stress on health include organic disorders, muscular symptoms such as tension and pain, digestive system disorders, symptoms affecting the circulatory system, respiratory system problems, central nervous system disorders and sexual problems.

Through our investigation into the consequences of professional stress on the health of workers in the wilaya of Bejaia, we found that the risk is worrying and requires a rigorous prevention approach. We have noted that professional stress is the cause of several pathologies and metabolic disorders, mainly: high blood pressure, heart pathologies, joint and muscle pain, lower back pain, digestive disorders, anxiety disorders and depression among workers in the wilaya of Bejaia.

The results of this survey show that the majority of companies do not take into consideration the malaise and stress of their employees. This can be explained by the fact that they neglect occupational medicine visits.

The Companies need to focus more on preventing stress in the workplace. For this reason, the fight against stress means first and foremost taking into account the needs of one's own employees. It is above all a collective awareness that needs to be acquired, with the principle that profitability must not be achieved at the expense of the individual. It's a collective awareness that needs to be stimulated to

gradually impose the idea that a cohesive team is far more effective than a group of isolated individuals pitted against each other. Finally, it's about raising individual awareness and understanding that stress is not a harmless phenomenon, but one of the main causes of suffering in the workplace. To achieve this, we need to think in terms of setting up a suitable work environment, while providing workers with an environment conducive to the development of their cognitive faculties, and eliminating the factors responsible for the nuisances that are at the root of stress.

There are, however, a number of limitations to this study. Firstly, the qualitative method used in this contribution generally presents a risk of subjectivity on the part of the interviewee. In addition, expanding the sample by interviewing a larger number of workers and using textual statistical analysis software would have made a considerable contribution to consolidating the results obtained. Finally, as this study is limited to a single region, its extension to other regions and countries would have been an important support for even more convincing results.

REFERENCES

Abdellaoui S, ea (2008). Health and work: the case of risk factors for musculoskeletal disorders of the upper limb. *Psychology of work and organizations*, 10.

AESST. (2006). Research on stress at work. Retrieved from the official publications of the European Communities:<http://europa.eu.int>

Albert, E., & Saunder, L. (2010). *Stress, how can the company act in the face of the stress of its employees?* Paris: Eyrolles.

Amar, P., Angel, P., Gava, M.-J., & Vaudolon. (2010). *Living better in the workplace: stress, burnout and harassment, an innovative response.* Paris: Dunod.

Askenazy, P. e. (2011). *Measure psychosocial risk factors at work to control them.* Paris: Report of the College of Expertise.

Baggio, S., Loyer, E., Merck, B., & Sutter, P.-E. (2009). *Avoid stress among your employees: diagnose, measure, analyze and act.* Paris: Eyrolles.

Bellinghausen, L. (2007). *Stress in the professional world. Fashion or reality with multiple issues?* Retrieved from doctoral thesis "biological and psychosocial aspects of stress: chrome-extension://oemmdcbldboiebfnladdacbfmadadm/<https://lisabellinghausen.files.wordpress.com/2011/05/me-moire-le-stress-professionnel.pdf>

Benchetrit, C. (2010). *Stress at work: an obstacle to effective management?* La Rochelle: CO SUP Group.

Berclaz, M. (2013). *Dealing with stress. Psychology of emergency and helping victims.* Geneva: Klondesign.

Billet, C. (2006). *Personal and professional development guide for managers and executives.* Paris: Maxima.

BIT. (1984). *Stress in industry: causes, effects and prevention.* Geneva: BIT.

BIT. (2013, 07 22). *Workplace stress prevention, checkpoint list, practical solutions for stress prevention in the workplace.* Retrieved from ILO:www.ilo.org

Bounhoure, J.-P. (2010). *Stress, depression and cardiovascular pathology.* Netherlands: Masson.

Carayon, P et al. (1995). Injuries attributable to repetitive work. Paris: Maloine. CES. (2005). Framework agreement on stress at work, interpretation guide from the ETUC and the European Commission. Retrieved from ETUC:www.etuc.org

Cherkaoui, W., & al, e. (2012). Organizational change and determinants of stress: exploratory study of stress perceived by nurses at the DS hospital in Morocco. (EMS, Ed.) management issues(0), 41-55.

Conne-Pettéard, E., Glardon, M.-J., Parrat, J., & Usel, M. (2001). Effects of unfavorable working conditions on the health of workers and their economic consequences. Retrieved from the French-speaking and Ticino conference of the cantonal worker protection offices AIPT:ftp://ftp.geneve.ch

Emont, P., Grésy, J.-E., & Pérez-Nukhel, R. (2012). Manage psychosocial risks; performance and well-being at work. Paris: ESF, Permanent Training collection.

FEACVT. (1995). Stress at work: causes, effects and prevention. Luxembourg: Office for Official Publications of the European Communities.

Frohlich, M.-D., Hooway, M.-D., & Hudzinski, D. (1988). hypertension and stress. *clincardiol*, 622.

Ginrac, A. (2011). stress at work, an inventory. *Management Perspective*, 1(41), 90.

Grebot, E. (2008). Stress and burnout at work: identify, prevent and cure. Paris: Eyrolles.

INRS. (2013). Stress at work, point of knowledge ED 5021. Paris: INRS.

INSERM. (2000). Low back pain in the workplace. What risk factors and what prevention? Paris: INSERM.

INSERM. (2011). Stress at work and health, situation among the self-employed. Paris: Inserm.

IRSST. (2011). Quebec survey on working conditions, employment and occupational health and safety. Special projects: studies and research. Montreal: IRSST.

Lefebvre, B., & Poirot, M. (2011). Stress and psychosocial risks at work. Paris: Elsevier Masson.

Lemaire, A. (2009). Clinical approach to arterial hypertension. Paris: Springer.

Lepage, R. (2023, 03 29). How stress influences your gastrointestinal health. Retrieved from biron.com:https://www.biron.com/fr/centre-du-savoir/parole-de-specialiste/gastrointestinal-stress.

Leruse, L., & alii, &. (2004). stress at work: risk factors, assessment and prevention. *FPS Employment, work and social consultation*, 7.

Luttmer Andrew & all. (2012). The welfare cost of perceived policy uncertainty: evidence from social security. Working paper, *Journal of Mathematical Economics*.

WHO. (2004, 08 10). Work organization and stress, systematic approaches to problems for employers, managers and union representatives, series protection of workers' health n°3. Retrieved from who.com:www.who.int.com

Rouat, S. (2010). Individual and organizational processes for building health at work: prevention of mental health at work and analysis of organizational systems. Doctoral thesis in occupational psychology. Lyon, France: Lumière University.

Servant, D. (2007). Stress and anxiety management. Paris: Masson.

Occupational stress and its consequences on workers' health in Algeria

Steiler, D. (2010). Preventing stress at work, from assessment to intervention. Paris: RETZ.

Stranks, J. (2005). stress at work. New York: Elsevier Butterworth Heinemann, Oxford.

Xavier, M., Patrice, C., & all, &. (2009). Risk management for sustainable development: quality, health, safety and environment. Paris: Dunod.