

ORIGINAL ARTICLE

# Professional stress risk factors evaluation among moroccan health staff

Hassan CHTIBI<sup>1</sup>, Khaoula MAMMAD<sup>1,2</sup>, Meriem CHKIRATE<sup>1</sup>, Ahmed AHAMI<sup>1</sup>

<sup>1</sup> Unit of Clinical and Cognitive Neuroscience and Nutritional Health, Department of Biology, Faculty of Science, Kenitra, <sup>2</sup> Director of Neuropsychological Center “Universal Healthy Brain Center”; Temara, Morocco.

*Correspondence to:* Unit of Clinical and Cognitive Neuroscience and Nutritional Health, Department of Biology, Faculty of Science, Kenitra, Marocco.

E-MAIL: universalhealthybraincenter@gmail.com

*Submitted:* 2023-07-13    *Accepted:* 2023-10-25    *Published online:* 2023-12-10

*Key words:*                    **Occupational risks; Burnout syndrome; Stress; health personnel; Hospital**

Act Nerv Super Rediviva 2023; 65(4): 139–149    ANSR65423A02

© 2023 Act Nerv Super Rediviva

## Abstract

Health staff are more exposed to work risks; namely, stress and burnout. Burnout or Professional Exhaustion syndrome is due to exposure to permanent and prolonged stress. **THE GOAL OF THE RESEARCH:** The ultimate goal of this piece of work is to study the work risk factors and to analyze the relationships that exist between psychological demand, decision latitude, social support and burnout inside a hospital.

**METHODS:** 270 health professionals are included in this study; they are working at Ibn Sina Hospital in Rabat / Morocco. A questionnaire was forwarded to all staff, it includes: socio-demographic and professional data; Karasek scale with its three components: Psychological Demand (DP), Decision Latitude (LD) and Social Support (SS). These three dimensions make it possible to identify risky situations. According to Karasek, it is the combination of these dimensions that promotes exposure to burnout reactions; Maslach Burnout Inventory (MBI) scale made up of three dimensions (Emotional Exhaustion, Depersonalization and feeling of low personal accomplishment at work) divided into three levels (low, intermediate, and high).

**RESULTS:** In all, 270 people participated at the study. The average age is  $38 \pm 4$  years old; 57% are female and 43% are male. The targeted population of our study is: 41% of cases are in job-strain; whereas, 83% of cases are in a state of burnout. The prevalence of work stress risk factors is 71.48% for high psychological demand, 45.55% for low decision latitude and 60.74% for low social support. 53.30% had a high emotional exhaustion score, 42.40% a high depersonalization score and 17.80% a low personal accomplishment score. The study of work risk factors shows that the high psychological demand is significantly associated with **age** ( $p = 0.00$ ), **sex** ( $p = 0.02$ ) and with **seniority at work** ( $p = 0.00$ ). As for burnout, it was correlated with **seniority at work** ( $p = 0.02$ ), **work schedule/ hours of work system** ( $p = 0.04$ ) and **means of transportation** used ( $p < 0.001$ ).

However, psychological demand was positively correlated with emotional exhaustion ( $r = 0.41$ ) and, also, with the relationship depersonalization ( $r = 0.26$ ). Decision latitude was found to be negatively correlated with emotional exhaustion ( $r = -0.23$ ). However, social support is negatively correlated with exhaustion ( $r = -0.25$ ) and with depersonalization ( $r = -0.12$ ).

**CONCLUSION:** This study has made it possible to evoke the role of certain factors in the genesis of a situation of work burnout which constitutes the starting point of deterioration of mental health. This justifies the development of a preventive strategy.

## INTRODUCTION

Work stress always costs; it influences people's health and it also has negative repercussions on the functioning of establishments. The diagnosis consists of evaluating the risk factors in order to reduce the sources of the burnout syndrome at the hospital. The Karasek questionnaire is widely used to assess socio-professional factors (Karasek Jr 1979). Indeed, many studies that focus on this questionnaire have shown that these factors are important determinants of staff health, performance and job satisfaction (Karasek et al. 1981; Karasek et al. 1988; Theorell et al. 1990; Schnall et al. 1994; Theorell & Karasek 1996; Niedhammer & Siegrist 1998; Peter & Siegrist 2000; Bressol 2004). Confronted with psychological demands associated with significant professional constraints, limited freedom of decision, psychological suffering and lack of support, health staff are not away from these risks (Theorell et al. 1990; Rizzo et al. 1970; Karasek Jr 1979). In this study, a karasek model is used. It defines work stress through organizational factors, namely psychological demand, decision latitude and social support.

Returning to literature, the professional environment the most exposed to stress is the one that combines both high psychological demands and low decision latitude (Niedhammer et al. 2006; Leroy-Frémont et al. 2014; Niedhammer et al. 2007). Hence, it may generate risks of burnout syndromes (Evans et al. 2006; Escribà-Agüir et al. 2006). In this case the organism will no longer be able to meet the demands of the work, and people's health will be affected (Colombat et al. 2011; Coursoux et al. 2012; Freudenberger 1974). In addition, the karasek model hypothesizes that freedom of decision and workload have opposite effects on the dimensions of burnout (Lourel et al. 2004).

Nevertheless, burnout is a real problem that remains underestimated and which generally manifests itself only at the stages of complications (Laraqui et al. 2019; Ben Zid et al. 2018; Barbier 2004). It is characterized by a varied symptomatology around three major components: emotional exhaustion, depersonalization and reduced self-fulfillment. It results from the lack of compatibility between the individual and his workplace. Indeed, the more the relationship between the individual and his professional environment is disturbed, the greater the risk of burnout will be important.

In Morocco, the burnout syndrome is insufficiently explored among health staff. Despite this insufficiency, there has been a real increase in interest in this theme, which is manifested in the work of certain authors (Laraqui et al. 2019; Elmossati et al. 2016; El Amri

et al. 2016a; Laraqui et al. 2008; Barmoussa et al. 2018). Those works raise high proportions of burnout among healthcare professionals at hospitals. Hence, we have been prompted to conduct this study whose objective is to assess the psychosocial risks, the burnout syndrome and the risk factors among health personnel.

## MÉTHODES & TOOLS

### Participants

This study was carried out at Ibn Sina hospital in Rabat, Morocco. It included 270 people belonging to three professional categories composed of 80 doctors, 150 nurses and 40 administrators. The subjects who took part in this study were recruited voluntarily with the agreement of the headteacher, department heads and after explaining the study to the entire team.

### Measuring instruments

In order to collect the data for our study, we distributed a self-administered questionnaire to all participants. It comprises two parts, the first one intended to collect socio-demographic variables: sex, age, professional status, marital status, seniority at work, means of transportation, state of health and pathological history. Whereas, the second part includes tools for evaluation burnout syndromes and workplace stressors.

### *Maslach Burnout Inventory (MBI)*

The Maslach Burnout Inventory (MBI) is used to assess the three dimensions of burnout syndrome (Dion & Tessier 1994). Emotional Exhaustion (EE), Dehumanization Relationship (DR) and Personal Accomplishment (PA). A high level of burnout is manifested through high scores for the "Emotional Exhaustion" and "Dehumanization Relationship" subscales, associated with a low score on the "Self-accomplishment" subscale and vice versa for a level weak burn-out (Barbier 2004; Maslach et al. 1986).

### *Karasek scale*

The Karasek questionnaire assesses risk factors for work stress. It comprises 26 items evaluating three components of the professional situation, namely the psychological demand to which the employee is subjected, the decision-making latitude available to him/her and the social support he/she receives at his/her workplace. This version is widely used around the world (Brisson et al. 1998; Houtman et al. 1999; Niedhammer 2002; Guignon et al. 2008).

The result of each component for each subject is compared to the median of the study sample. "Job strain" is defined as a situation where the psychological demand is higher than the median and the decision latitude lower than the median, which constitutes a situation at risk for the worker health (Karasek Jr 1979; Karasek 1990; Belkic et al. 2004; Van der Doef & Maes 1999; Hoogendoorn et al. 2000)

**Tab. 1.** Socio-demographic and socio-professional characteristics of respondents

		Number of Population (Total Number = 270)	Percentage
Grade	Nurse	150	55.6
	Doctor	80	29.6
	Administrator	40	14.8
Sex	Male	117	43.3
	Female	153	56.7
Age	<25	29	10.7
	25<>35	91	33.7
	35<>45	56	20.7
	45<>55	67	24.8
	>55	27	10.0
Personal Status	Single	89	33.0
	Married	161	59.6
	Divorced	16	5.9
	Widow/ Widower	4	1.5
Seniority at work	<5	73	27.0
	5<>10	48	17.8
	10<>20	74	27.4
	>20	75	27.8
Hours of Work System	12/36	47	17.4
	Continue	187	69.3
	Normale	33	12.2

### Data analysis

The variables were expressed through medium and standard deviation (SD) or through median and inter-quartile range (25% and 75% quartile) or through percentages. In the case of multiple-choice answers, an analysis using a chi-square test made it possible to compare the frequency of the answers given within the groups. All statistical analyzes were performed using SPSS software.

Finally, in order to investigate the link between mental suffering at work and burnout, multiple correlations were made. A  $p$ -value of  $<0.05$  was considered statistically significant.

### Results

#### Socio-demographic and socio-professional characteristics

Three hundred and two questionnaires were received; however 32 were none used ; among which 20 were incomplete and 12 were rejected for the exclusion criterion mentioned above. The study then involves 270 participants (Table 1), 55.6% among them are nurses, 29.6% are doctors and 14.8% are administrators. The average age of the respondents is  $38.38 \pm 4$  years with extremes of 24 and 56 years. The distribution according to age category shows 10.7% ( $n = 29$ ) are under 25 years old and 10% ( $n = 27$ ) are over 55 years

old, while the rest of the staff aged between 25 and 55 years old (79.3%). The distribution of respondents by gender shows that 56.7% ( $n = 153$ ) are female and 43.3% ( $n = 117$ ) are male. The sex ratio is, therefore, not balanced ( $F/M = 1.31$ ) ( $p < 0.033$ ). However, 59.6% ( $n = 161$ ) of the respondents are married and 33% ( $n = 89$ ) are single. On the other hand, 27% ( $n = 73$ ) have a seniority at work of less than 5 years and are, therefore, recently recruited and 27.8% ( $n = 75$ ) have a seniority at work of more than 20 years of work service, while 45.2% have a seniority at work in the position between 5 and 20 years. Regarding the time system adopted by caregivers, 69.3% follow the continuous schedule system, 12.2% the normal time system and 17.4% the 12/36 system.

#### Maslach Burnout Inventory (MBI) scale

In order to study the phenomenon of burnout in our community, the Maslach Burnout Inventory (MBI) scale is used. The Cronbach's alpha index is 0.83 for Emotional Exhaustion, 0.70 for Depersonalization and 0.65 for Professional Accomplishment. This shows that the internal consistency coefficients obtained in this survey are comparable to those found in previous studies (Hogan & McKnight 2007; Genoud *et al.* 2009).

**Tab. 2.** Distribution of the population according to its level of burnout in each component

	Low Level	Moderate level	High Level	Total Number of Population
Emotional Exhaustion	46 (17.20%)	80 (29.50%)	143 (53.30%)	269
Dehumanization ofrelationships	82 (30.50%)	73 (27.10%)	115 (42.40%)	270
Self accomplishment	131 (48.70%)	91 (33.50%)	48 (17.80%)	270

**Tab. 3.** Multiple correlation between the three dimensions of Burnout Scale

	Emotional Exhaustion	Depersonalization	Accomplishment
Emotional Exhaustion	1	r= 0.478** (p<0.00)	r=0.03 (p<0.56) (ns)
Depersonalization	r= 0.47** (p<0.00)	1	r=-0.14* (p<0.02)
Accomplishment	r=0.03 (p<0.56) (ns)	r=-0.14* (p<0.02)	1

r = correlation coefficient (p-value); \* : significant difference ; \*\*: very highly significant difference; ns: not significant

Among the 270 employees included in this study, 143 (53.30%) have a high level of emotional exhaustion, while 80 people (29.50%) have a moderate score level, and 46 (17.20 %) did not express emotional exhaustion (Table 2). The average score is 30.78 (± 12.02), with extremes ranging from 0 to 54 in case of referring to the limits established by Maslach and Jackson (Maslach et al. 1986).

Depersonalization affects at a high level 115 caregivers (42.40%), at a moderate level 73 caregivers (27.10%), and low for 82 caregivers (30.50%). The average depersonalization score is 11.32 (±7.36) with extremes ranging from zero to 30.

The loss of the sense of self-accomplishment is high for 131 subjects (48.70%), moderate for 91 people

(33.50% %) and low for 48 people (17.80%). The average personal achievement score is 33.21 (± 7.93), with extremes ranging from 0 to 48.

The results of this study show the prevalence of burnout is 83% (n = 225); 36% (n = 97) had only one high component, 32% (n=86) two components and 15% (n = 42) three abnormal components.

*Multiple Correlation between the three dimentionions of MBI*

Table 3 clarifies that the multiple correlation between the three dimensions of the burnout scale. It follows that emotional exhaustion is positively correlated with depersonalization (r = 0.478 (p < 0.000)). On the other hand, the depersonalization of relationships evolves

**Tab. 4.** Association between socio-demographic and socio-professional variables and burnout

	1	2	3	4	5	6	7	8	9	10	11
sex	1,00	-0,19**	0,02	-0,11	-0,00	-0,02	0,17**	0,07	-0,08	-0,048	0,017
age		1,00	0,50**	0,81**	0,31**	-0,13*	-0,03	0,139*	0,10	0,246**	0,024
Marital Status			1,00	0,48**	0,20**	-0,22**	-0,04	0,08	0,02	0,07	0,012
Work Seniotity				1,00	0,33**	-0,15**	0,02	0,16**	0,13*	0,138*	0,049
Job					1,00	0,04	-0,18**	-0,01	0,00	0,022	0,054
Mean of Transportation						1,00	-0,12*	0,05	-,124*	-0,086	0,041
Hours of Work							1,00	0,04	,146*	0,086	-0,056
Etat de santé								1,00	-0,00	-0,023	-0,098
Epuisement émotionnel									1,00	,397**	-0,05
Dépersonnalisation										1,00	-0,14*
Accomplissement professionnel											1,00

**Tab. 5.** Analysis of variance effect “work stress category” on the score obtained for each dimension

Dimension		Number of people %	Mean	Standard Deviation	Mini	Max	Fisher	P value
DP	Weak	77 (28.52%)	18.42	2.64	10.00	21.00	35.27	<b>0.00***</b>
	Strong	193 (71.48%)	25.84	3.00	22.00	34.00		
	Total	270	23.73	4.43	10.00	34.00		
LD	Weak	147 (54.44%)	61.22	8.59	30.00	70.00	35.15	<b>0.00***</b>
	Strong	123 (45.55%)	79.12	6.53	72.00	96.00		
	Total	270	69.37	11.80	30.00	96.00		
SS	Weak	164 (60.74%)	20.35	3.50	8.00	24.00	33.64	<b>0.00***</b>
	Strong	106 (39.26%)	27.27	2.06	25.00	32.00		
	Total	270	23.07	4.53	8.00	32.00		

In bold: significant results. Highly significant: \*\*\* $p \leq .01$ .

in the opposite direction of work accomplishment ( $r = -0,14$ ) ( $p < 0.02$ ).

#### Association between socio-demographic and socio-professional variables and BO

Table 4 presents the correlation between the variables studied in our sample.

Gender, marital status, work and health status of workers are not correlated neither with emotional exhaustion, nor with depersonalization nor with accomplishment.

Concerning personal factors, it is noticed that age is only correlated with depersonalization ( $p = 0.000$ ) while seniority at work is significantly associated with emotional exhaustion ( $p = 0.02$ ) and depersonalization ( $p = 0.02$ ).

The study also has helped to find out that a significant association exists between emotional exhaustion and external factors, namely working hours ( $p = 0.01$ ) and the means of transportation used to get to the workplace ( $p = 0.04$ ). Thus, this confirms that this dimension of burnout is more sensitive to the socio-professional factors of the personnel.

Besides, age is positively and significantly associated with marital status, seniority, work, state of health. Meanwhile, age is negatively associated with the means of transportation used to arrive at work. The gender factor is negatively associated with age and positively with work schedule. Seniority at work is positively associated with the job and the state of health and negatively with the means of transportation. Finally, the working hour factor is negatively associated with the job and the means of transportation. This confirms that these variables can lead to sensitivity to the problem of psychosocial risks.

#### Stress factors at work (Karasek scale)

Karasek's model focuses on the evaluation of work stress. It was designed by the American psycho-sociologist Robert Karasek in 1979. It assesses work-related risk

factors; the intensity of the physical demands to which an employee is subjected, the decision-making latitude granted to him and the social support he/ she receives.

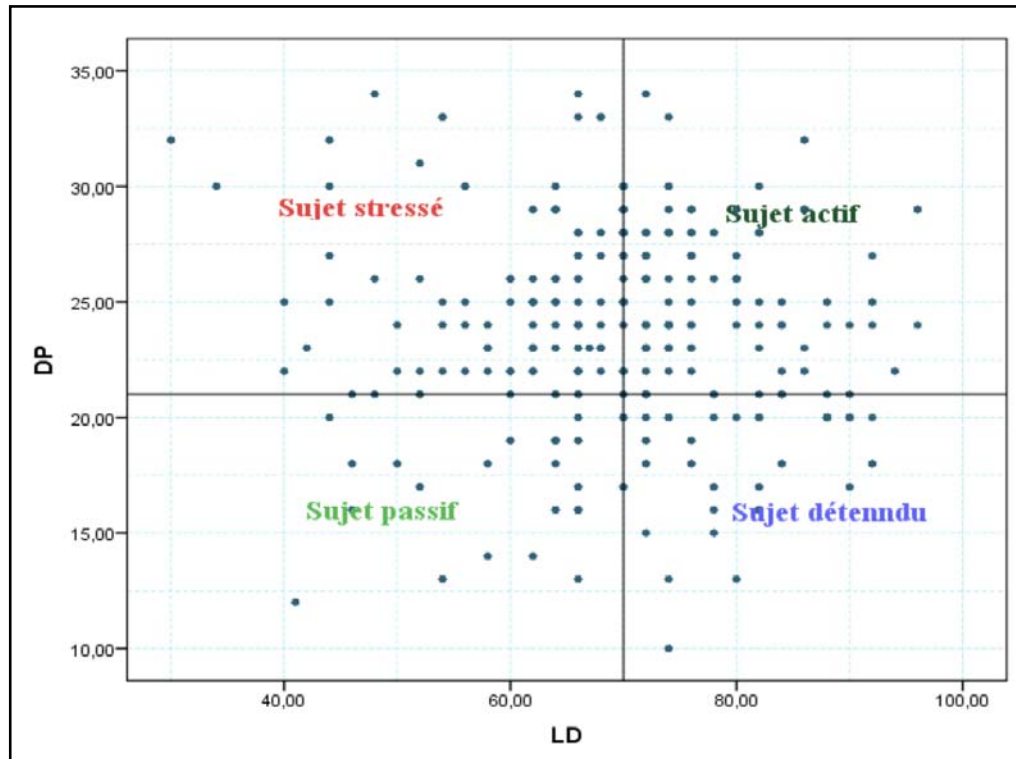
#### Karasek test study

In this part, we will describe in a separate way the three dimensions from which the karasek test is composed. To make sure of the reliability of this scale, the calculation of Cronbach's alpha coefficients which is between 0.70 and 0.78 reflect high reliability.

The results are expressed either as a number or as a mean  $\pm$  standard deviation. The comparison of the means is made by the student test.

Table 5 presents the results of the “category effect” analysis of variance according to the scores obtained for each dimension.

- For the “Psychological Demand (PD)” dimension. The results for this dimension show that 71.48% ( $n = 193$ ) of the employees have a high Psychological Demand (score above 20) and 28.52% ( $n = 77$ ) have a low Psychological Demand (score below 20). Moreover, the average score among those with a high Psychological Demand is  $25.84 \pm 3$ , with a minimum score of 22 and a maximum score of 34 and among the category of employees with a low Psychological Demand, it is  $18.42 \pm 2.64$  (minimum = 10 and maximum = 22). The variance analysis shows a very highly significant effect of job strain on the distribution of scores (Fisher = 358;  $p < 0.000$ ).
- For the “Decisional Latitude (LD)” dimension. The distribution of scores obtained by each respondent according to the prescribed standard (median = 71) shows that 45.55% ( $n = 123$ ) of employees have a high degree of decision-making latitude (score above 71), with an average score of  $79.12 \pm 6.53$  (minimum = 72 and maximum = 96) and 54.44% ( $n = 147$ ) have low decision latitude (score less than 71) whose average score reaches  $61.22 \pm 8.59$  (minimum = 30 and max 70). The variance analysis shows a very highly significant effect of job strain on the distribution of scores



**Fig. 1.** Distribution of respondents according to scores of decision latitude and psychological demand

(Fisher = 358;  $p < 0.000$ ). The mean comparison test by tukey shows a very highly significant difference ( $p < 0.000$ ).

- For the “Social Support (SS)” dimension. The distribution of scores in comparison with the median norm (24) shows that 39.26% ( $n = 106$ ) of respondents have strong Social Support, with an average score of  $27.6 \pm 2.06$  and 60.74% ( $n = 164$ ) have low Social Support (mean score =  $20.35 \pm 3.5$ ). The Fisher test shows a significant effect of the categories of this dimension on the distribution of scores (Fisher = 336.64;  $p < 0.000$ ).

*Projection of the average points of the two dimensions: Psychological Demand and Decision Latitude.*

Figure 1 is structured by two axes representing the median values of Psychological Demand as well as Decision Latitude. This figure shows four categories of different levels of stress.

The category of stressed people “tense” or “job strain” where the Psychological Demand score is greater than 20 and the Decision Latitude score less than 71, has a prevalence of 41.11% ( $n = 111$ ). The prevalence of isostrain is 25.44% (69%).

The second category of relaxed employees, where the Psychological Demand score is less than 20 and the Decision Latitude score greater than 71; thus, represents 15.18% ( $n = 41$ ). The employee is in a “relaxed situation”, and therefore considered in a normal situation.

The two remaining categories are that of passive and active subjects. They are represented respectively by rates of 13.33% ( $n = 36$ ) and 30.37% ( $n = 82$ ) (at 20 and

a Decision Latitude score lower than 71 while for active subjects have a Psychological Demand greater than 20 and a decision latitude score greater than 71.

*Correlation with sociodemographic and socioeconomic characteristics:*

In order to draw the possible connections between the three dimensions, we resorted to multiple correlation test of the scale of Karasek. So, the result is that Decision Latitude is positively correlated with social support. Similarly, Psychological Demand evolves in the opposite direction to Decision Latitude and Social Support (SS), but the connection is not significant (Table 6).

To make sure whether there are significant links between socioeconomic characteristics and risk factors, a correlation study was conducted between these variables and the scores obtained on the Karasek questionnaire. Indeed, our results indicate statistically significant relationships between age, gender, seniority and high Psychological Demand (Table 6).

*Association between risk factor and burnout.*

Table 7 presents the multiple correlation results between the dimensions of the two tests (MBI and Karasek). This table shows that the dimensions are significantly correlated with each other with differences in degree of significance and sign of correlation. However, Psychological Demand was positively correlated with Emotional Exhaustion ( $r = 0.41$ ) and with Relationship Depersonalization ( $r = 0.26$ ). On the other hand, Decision Latitude was found to be negatively correlated with Emotional Exhaustion ( $r = - 0.23$ ). However,

Tab. 6. Multiple correlations

Dimension	1	2	3	4	5	6	7	8	9	10	11
sex	1	-0.19**	0.02	-0.11	-0.00	-0.02	0.17**	0.07	-0.13*	0.05	0.05
		0.00	0.7	0.06	0.9	0.6	0.00	0.19	0.02	0.35	0.37
age	-0.19**	1	0.50**	0.81**	0.31**	-0.13*	-0.03	.139*	.17**	-0.01	0.01
	0.00		0	0	0	0.02	0.59	0.02	0.00	0.76	0.84
Marital Status	0.02	0.50**	1	0.48**	0.20**	-0.22**	-0.04	0.08	0.06	0.10	0.01
	0.72	0		0	0.00	0	0.47	0.15	0.26	0.08	0.80
Work Seniority	-0.11	0.81**	0.48**	1	0.33**	-0.15**	0.02	0.16**	0.16**	0	0.01
	0.06	0	0		0	0.01	0.73	0.00	0.00	0.99	0.76
Job	-0.00	0.31**	0.20**	0.33**	1	0.04	-0.18**	-0.01	0.09	0.09	0.02
	0.95	0	0.001	0		0.51	0.00	0.86	0.14	0.11	0.68
Means of Transportation	-0.02	-0.13*	-0.22**	-0.15**	0.04	1	-0.12*	0.05	-0.09	-0.00	0.01
	0.68	0.02	0	0.01	0.51		0.04	0.35	0.10	0.94	0.82
Hours of work	0.17**	-0.03	-0.04	0.02	-0.18**	-0.12*	1	0.04	-0.05	0.04	-0.00
	0.00	0.59	0.47	0.73	0.00	0.04		0.44	0.35	0.49	0.88
Health Status	0.07	0.13*	0.08	0.16**	-0.01	0.05	0.04	1	-0.03	-0.03	-0.02
	0.19	0.02	0.15	0.00	0.86	0.35	0.44		0.58	0.54	0.71
« PD »	-0.13*	0.17**	0.06	0.16**	0.09	-0.09	-0.05	-0.03	1	-0.08	-0.06
	0.02	0.00	0.26	0.00	0.14	0.10	0.35	0.58		0.17	0.31
« DL »	0.05	-0.01	0.10	0	0.09	-0.00	0.04	-0.03	-0.08	1	0.12*
	0.35	0.76	0.08	0.9	0.11	0.94	0.49	0.54	0.17		0.04
« SS »	0.05	0.01	0.01	0.019	0.02	0.01	-0.00	-0.0	-0.06	0.12*	1
	0.37	0.84	0.80	0.76	0.68	0.82	0.88	0.7	0.31	0.04	

\*\* : Correlation is significant at the 0.01 level (2-tailed); \* : Correlation is significant at the 0.05 level (2-tailed). Corr: Correlation; Sig : Meaning (2-tailed). PD : Psychological demand; DL : Decision latitude; SS: Social support

Social support is negatively correlated with exhaustion ( $r = -0.25$ ) and with depersonalization ( $r = -0.12$ ).

At the light of these results, it is possible to qualify the group of professionals resistant to the effects of burnout as having a low degree of Emotional Exhaustion and Depersonalization, as well as having high degree of Decisional Latitude and Social Support.

## DISCUSSION

Work stress is a major work health problem. However, a very few researches has investigated the factors behind the burnout syndrome in healthcare workers. Nurses, doctors and administrators (all of them are working in the field of health) are the sample of this study whose main objective is to study the perceived work stress factors and to analyze the relationships that exist between these risk factors and the burnout in a hospital establishment. This is a study that hypothesizes that Psychological Demand, Decision Latitude and social support have opposite effects on the components of burnout.

The results obtained show a high level of burnout among health workers. 83% of people show burnout in at least one component with a high score, 32% two components and 15% a high level of burnout in the three components in case of referring to the limits established by Maslach and Jackson (Maslach *et al.* 1986). These results are in line with those found in previous studies conducted with health workers in Morocco and around the world (El Amri *et al.* 2016; Battal *et al.* 2015; Laraoui *et al.* 2008; Kalboussi *et al.* 2019). Moreover, burnout affects nurses, doctors and administrators, whose observed levels of this syndrome are comparable among the three professional categories. These findings indicate that burnout does not only affect caregivers but also affects administrative staff whose job includes service relationships with patients or their families but not oriented towards a care relationship (Cordes & Dougherty 1993). Besides, the fact that burnout levels are comparable among health professions may be explained by characteristics specific to the health sector (Rivière *et al.* 2013).

As a result, our targeted population is in job-strain in 41% of cases. This result corroborates several studies

Tab. 7. Global matrix of multiple correlations

Features	1	2	3	4	5	6	7	8	9	10	11	12	13	14
sex	1.00	<b>-0.19**</b>	0.02	-0.11	-0.00	-0.02	<b>+0.17**</b>	0.07	-0.13*	0.05	0.05	-0.08	-0.04	0.01
age	1.00	1.00	<b>+0.50**</b>	<b>+0.81**</b>	<b>+0.31**</b>	<b>-0.13*</b>	-0.03	<b>+0.13*</b>	<b>+0.17**</b>	-0.01	0.01	0.11	<b>+0.24**</b>	0.02
Marital Status	1.00	1.00	1.00	<b>+0.48**</b>	<b>+0.20**</b>	<b>-0.22**</b>	-0.04	0.08	0.06	0.10	0.01	0.02	0.07	0.01
Work Seniority	1.00	1.00	1.00	1.00	<b>+0.33**</b>	<b>-0.15**</b>	0.02	<b>+0.16**</b>	<b>+0.16**</b>	0.00	0.01	<b>+0.13*</b>	<b>+0.14*</b>	0.04
Job	1.00	1.00	1.00	1.00	1.00	0.04	<b>-0.18**</b>	-0.01	0.09	0.09	0.02	0.00	0.022	0.05
Means of Transportation	1.00	1.00	1.00	1.00	1.00	1.00	<b>-0.12*</b>	0.05	-0.09	-0.00	0.01	-0.12*	-0.08	0.04
Hours of Work	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.04	-0.05	0.04	-0.00	<b>+0.14*</b>	0.086	-0.05
Health Status	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-0.03	-0.03	-0.02	-0.006	-0.023	-0.09
PD	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	<b>+0.28**</b>	-0.06	<b>+0.41**</b>	<b>+0.25**</b>	-0.00
DL	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	<b>+0.12*</b>	<b>-0.22**</b>	-0.09	0.09
SS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	<b>-0.24**</b>	-0.12*	<b>+0.20**</b>
Emotional Exhaustion	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	<b>+0.39**</b>	-0.05
Depersonalization	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-0.14*
Self Accomplishment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

In bold: significant results. Not significant: p ≥ .05; significant: p < .05; \*p < .05; \*\*p ≤ .01.

on healthcare professionals where the prevalence of work stress is greater than 21% among health-care staff (Laraqui et al. 2019; Tripodi et al. 2007; Guignon et al. 2008).

These results confirm our hypotheses and explain the causes of burnout among professionals at the Ibn sina hospital in Rabat. Indeed, Psychological Demands at work act on Emotional Exhaustion and Depersonalization. The higher the level of the Psychological Demands of the work, the more the person is exposed to burnout. Decision Latitude at work has a negative effect on Emotional Exhaustion. According to the Karasek model, the more autonomy the employee has and with a certain control over the professional activity, the more he is protected against burnout. Similarly, Social Support at work is negatively associated with Emotional Exhaustion and Depersonalization. Social Support of the staff is a negative predictor of hospital burnout. These results confirm those obtained by previous studies (Bourbonnais et al. 1998; Lourel et al. 2004)

Furthermore, it is noted that contrary to our expectations, freedom of decision does not affect the depersonalization dimension of burnout. This result deserves additional investigations to better understand the depersonalization dimension.

Concerning socio-demographic and socio-professional characteristics, our results show that age has a positive effect on depersonalization. This means that the older the employees are, the more the level of depersonalization increases. These results also reveal that seniority at work is a source of Emotional Exhaustion and Depersonalization. In other words, this result indicates that seniority can accumulate stress, increasing the risk of burnout. Social Support has been identified as one of the best protective factors against burnout (Duquette et al. 1994).

These results are analyzed taking into account the strengths and limitations of the present study. Among these strengths is its originality, since it is one of the first studies to assess the risk factors for work stress among health staff in Morocco, even though contradictory assumptions have been put forward elsewhere (Rakotondrainibe et al. 2018; Bounsir & Tazi 2008).

Our study focuses on employees of different categories. However, our results are analyzed by the fact that the professionals who participated in this study work in different departments and that the number of responses is very variable depending on socio-professional and socio-personal variables. The results of this study have limitations due to the narrowness of the sample and comparisons with the results of previous studies are difficult given that the methods used are different according to the studies, that the populations studied are variable



due to targeted hospital and, also the country; hence, the targeted environment may modify the type of burnout factors.

In this work, age, seniority, hours worked and the means of transportation used to move to the workplace are considered risk factors. These results are similar to those of previous studies and reveal socio-demographic and socio-professional factors that can generate burnout syndrome (Hazif-Thomas & Thomas 2011; Hardy 2018; Mion *et al.* 2013; Laraqui *et al.* 2008; El Amri *et al.* 2016; Genoud *et al.* 2009; El Kettani *et al.* 2017; Martin *et al.* 1997; Maslach & Jackson 1981).

In this study, the prevalence of burnout increases with age. This affirms that elderly people whose HPA axis has changed over time have become increasingly vulnerable to the effects of stress (Lissandre *et al.* 2008; Lupien *et al.* 2009). This correlation is controversial: for some authors, age is not found as a risk factor (Halayem-Dhouib *et al.* 2010) and for others, the youngest subjects seem the most vulnerable to professional exhaustion (Maslach & Jackson 1981; Martin *et al.* 1997; Laurent & Chahraoui 2012).

Then, the job tenure variable is positively correlated with Emotional Exhaustion and Depersonalization. Contrary to certain studies (Laurent & Chahraoui 2012; Chuang *et al.* 2016) which have reported that seniors in the career are more resistant to burnout than young people, our results assume that seniority at work in the career represents a socio-professional risk factor for our population. Workers at the end of their careers, who were older, logically perceived themselves to be in poorer health, had overall poorer indicators of general quality of life, and despite better general working conditions, showed a tendency towards more work burnout than their early career colleagues.

Therefore, age and seniority are two dependent elements. The oldest and longest-serving people show a tendency towards more dehumanization of the relationship with the patient (Zavidovique *et al.* 2018; Lissandre *et al.* 2008) suggesting the gradual acquisition of skills relationships facilitating resistance to harsh working conditions. This distancing can be felt as a form of resistance to stress by keeping disturbing emotions at a distance, which are essential for medical and paramedical activities (Canouï *et al.* 2001). Resistance to stress is particularly called upon in the caregiver-patient relationship, but also due to difficult working conditions.

In this work, the type of schedule worked is positively correlated with the symptoms of burnout. Indeed, the group of staff working in "12/36 hours" present lower levels of Emotional Exhaustion compared to the groups who work in "continuous" or "normal" type of schedule. Indeed, the 12-hour work schedule represents a protective factor against Emotional Exhaustion. Previous studies point in the same direction (Delbrouck 2008). Returning to the literature, the organization of the working time of the health staff is

imperative to reduce the effects of stress and improve the state of the health of the workers (West *et al.* 2009; Landrigan *et al.* 2004).

Similarly, the role of the means of transportation in the occurrence of burnout is much debated. For our study, the means of transportation used to get to work is significantly linked to Emotional Exhaustion, it therefore represents a risk factor for Professional Exhaustion. These results are similar to those found by some authors (Laraqui *et al.* 2008).

As for the consequences, our study also suggests that this Professional Exhaustion is at the origin of a drop in performance (Genoud *et al.* 2009) which can increase the number of the work errors committed by our population (Larouche 1985; Shanafelt *et al.* 2012; Galam 2012).

## CONCLUSION

In this piece of work, 41% of the staff are on job-strain and 83% suffer from burnout. Job demands, lack of autonomy, and low Social Support are a major risk factor for stress that contributes to burnout syndrome. Assuming that it is impossible to completely eradicate the causes of burnout around the hospital environment, it is imperative to put in place preventive actions to improve living conditions at work. Professional well-being must be considered as an indicator of performance, health and safety at work.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study approved by the Ibn sina hospital center (DCHIS/SPRBC/25/15).

The dataset on which this paper is based is too large to be retained or publicly archived with available resources. Documentation and methods used to support this study are available from universalhealthybrain-center@gmail.com at Ibn Tofail University."

## REFERENCES

- 1 Barbier D (2004). Le syndrome d'épuisement professionnel du soignant. *La Presse Médicale*. **33**(6): 394–399.
- 2 Barmoussa O, El Meghraoui H, Haddiya I, Bentata Y (2018). Syndrome du burnout chez les résidents en néphrologie au Maroc. *Néphrologie & Thérapeutique*. **14**(5): 388.
- 3 Battal S, Toufik S, Kerak E (2015). Etude bibliographique sur les risques psychosociaux et qualité de vie au travail au Maroc [Literature review on psychosocial risks and quality of worklife in Morocco]. *Int J Innov Appl Stud*. **11**(2): 479.
- 4 Belkic KL, Landsbergis PA, Schnall PL, Baker D (2004). Is job strain a major source of cardiovascular disease risk? *Scand J Work Environ Health*. **30**: 85–128.
- 5 Ben Zid A, Homri W, Ben Romdhane I, Bram N, Labbane R (2018). Burnout chez les résidents en médecine tunisiens: À propos de 149 cas. *L'Encéphale*. **44**(4): 337–342.
- 6 Bounsir A & Tazi I (2008). *Burnout chez les étudiants de la Faculté de Médecine et de Pharmacie de Marrakech* [PhD Thesis]. Thèse de médecine, Marrakech 2008.

- 7 Bourbonnais R, Comeau M, Vézina M, Dion G (1998). Job strain, psychological distress, and burnout in nurses. *Am J Ind Med.* **34**(1): 20–28.
- 8 Bressol E (2004). *Organisation du travail et nouveaux risques pour la santé des salariés*. Les éditions des journaux officiels.
- 9 Brisson C, Blanchette C, Guimont C, Dion G, Moisan J, Vézina M, et al. (1998). Reliability and validity of the French version of the 18-item Karasek Job Content Questionnaire. *Work & Stress.* **12**(4): 322–336.
- 10 Canoui P, Mauranges A, Florentin A (2001). *Le syndrome d'épuisement professionnel des soignants : De l'analyse du burn out aux réponses*. Masson.
- 11 Chuang C-H, Tseng P-C, Lin C-Y, Lin K-H, Chen Y-Y (2016). Burnout in the intensive care unit professionals. *Medicine.* **95**(50): e5629.
- 12 Colombat P, Altmeyer A, Barruel F, Bauchetet C, Blanchard P, Copel L, et al. (2011). Syndrome d'épuisement professionnel des soignants. *Oncologie.* **13**(12): 845–863.
- 13 Cordes CL & Dougherty TW (1993). A review and an integration of research on job burnout. *Acad Manage Rev.* **18**(4): 621–656.
- 14 Cursoux P, Lehucher-Michel M-P, Marchetti H, Chaumet G, Delliaux S (2012). Syndrome de burnout : Un «vrai» facteur de risque cardiovasculaire. *La Presse Médicale.* **41**(11): 1056–1063.
- 15 Delbrouck M (2008). *Le burn-out du soignant*. De Boeck Supérieur. <https://doi.org/10.3917/dbu.delbr.2008.01>
- 16 Dion G & Tessier R (1994). Validation de la traduction de l'Inventaire d'épuisement professionnel de Maslach et Jackson. *Can J Behav Sci.* **26**(2): 210.
- 17 Duquette A, Kérowc S, Sandhu BK, Beaudet L (1994). Factors Related to Nursing Burnout A Review of Empirical Knowledge. *Issues Ment Health Nurs.* **15**(4): 337–358.
- 18 El Amri I, Allouche W, Benali B, El Kholti A (2016). Évaluation du burnout chez le personnel soignant au niveau du service d'accueil des urgences du CHU Ibn Rochd. *Arch des Mal Prof et de l'Environnement.* **77**(3): 560.
- 19 El Kettani A, Serhier Z, Othmani MB, Agoub M, Battas O (2017). L'évaluation du syndrome du Burnout chez les médecins en formation au CHU Ibn Rochd de Casablanca. *The Pan African Medical Journal.* **27**: 243.
- 20 Elmoassati MS, Ahami AO, Oudda H, Elkettani Y (2016). Évaluation de l'épuisement professionnel chez les enseignants universitaires au Maroc/[Assessing burnout among university teachers in Morocco]. *Int J Innov Appl Stud.* **16**(4): 914.
- 21 Escribà-Agüir V, Martín-Baena D, Pérez-Hoyos S (2006). Psychosocial work environment and burnout among emergency medical and nursing staff. *Int Arch Occup Environ Health.* **80**(2): 127–133.
- 22 Evans S, Huxley P, Gatley C, Webber M, Mears A, Pajak S, et al. (2006). Mental health, burnout and job satisfaction among mental health social workers in England and Wales. *Br J Psychiatry.* **188**(1): 75–80.
- 23 Freudenberg HJ (1974). Staff burn-out. *J Soc Issues.* **30**(1): 159–165.
- 24 Galam É (2012). Burnout. In É. Galam, editor. *L'erreur médicale, le burnout et le soignant : De la seconde victime au premier acteur*. Springer, p. 123-137. [https://doi.org/10.1007/978-2-8178-0295-4\\_7](https://doi.org/10.1007/978-2-8178-0295-4_7)
- 25 Genoud PA, Brodard F, Reicherts M (2009). Facteurs de stress et burnout chez les enseignants de l'école primaire. *Eur Rev Appl Psychol.* **59**(1): 37–45.
- 26 Guignon N, Niedhammer I, Sandret N (2008). *Les facteurs psychosociaux au travail : Une évaluation par le questionnaire de Karasek dans l'enquête Sumer 2003*.
- 27 Halayem-Dhouib S, Zaghdoudi L, Zremdini R, Maalej I, Béchir MB, Labbène R (2010). Burnout en psychiatrie : Une expérience tunisienne. *Revue d'épidémiologie et de santé publique.* **58**(6): 403–408.
- 28 Hardy P (2018). Chapitre 2. La prévention des risques psychosociaux chez les médecins en structure de soins. In *La souffrance des soignants*. Dunod, p. 41-68. <https://www.cairn.info/souffrance%20des%20soignants--9782100774920-page-41.htm>
- 29 Hazif-Thomas C & Thomas P (2011). Burnout et soignants : Un risque inépuisable? *NPG Neurologie-Psychiatrie-Gériatrie.* **11**(65): 181–187.
- 30 Hogan RL & McKnight MA (2007). Exploring burnout among university online instructors: An initial investigation. *Internet High Educ.* **10**(2): 117–124.
- 31 Hoogendoorn WE, van Poppel MN, Bongers PM, Koes BW, Bouter LM (2000). Systematic review of psychosocial factors at work and private life as risk factors for back pain. *Spine.* **25**(16): 2114–2125.
- 32 Houtman I, Kornitzer M, Smer PD, Koyuncu R, Backer GD, Pelfrene E, et al. (1999). Job stress, absenteeism and coronary heart disease European cooperative study (the JACE study) : Design of a multi-centre prospective study. *European J Public Health.* **9**(1): 52–57.
- 33 Kalboussi H, Chouchane A, Ferhi F, Nsir L, Maoua M, El Guedri S, et al. (2019). Facteurs associés au burn-out chez les techniciens supérieurs d'anesthésie réanimation dans un centre hospitalo-universitaire au centre tunisien. *Annales Médico-psychologiques, revue psychiatrique.* **178**: 901–907, <https://doi.org/10.1016/j.amp.2019.08.005>
- 34 Karasek Jr RA (1979). Job demands, job decision latitude, and mental strain : Implications for job redesign. *Administrative Science Quarterly.* **24**: 285–308.
- 35 Karasek R (1990). *Healthy work. Stress, productivity, and the reconstruction of working life*. New York: Basic Books.
- 36 Karasek RA, Theorell T, Schwartz JE, Schnall PL, Pieper CF, Michela JL (1988). Job characteristics in relation to the prevalence of myocardial infarction in the US Health Examination Survey (HES) and the Health and Nutrition Examination Survey (HANES). *Am J Public Health.* **78**(8): 910–918.
- 37 Karasek R, Baker D, Marxer F, Ahlborn A, Theorell T (1981). Job decision latitude, job demands, and cardiovascular disease : A prospective study of Swedish men. *Am J Public Health.* **71**(7): 694–705.
- 38 Landrigan CP, Rothschild JM, Cronin JW, Kaushal R, Burdick E, Katz JT, et al. (2004). Effect of reducing interns' work hours on serious medical errors in intensive care units. *N Engl J Med.* **351**(18): 1838–1848.
- 39 Laraoui O, Laraoui S, Tripodi D, Caubet A, Verger C, Laraoui CH (2008). Évaluation du stress chez le personnel de santé au Maroc : À propos d'une étude multicentrique. *Arch des Mal Prof et de l'Environnement.* **69**(5/6): 672–682.
- 40 Laraoui O, Manar N, Laraoui S, Hammouda R, Deschamps F, Laraoui C (2019). Risques psychosociaux et syndrome d'épuisement professionnel des professionnels de soins hospitaliers. *Arch des Mal Prof et de l'Environnement.* **80**(5): 368–397.
- 41 Larouche LM (1985). [Clinical manifestations of burnout in physicians.]. *Sante Mentale Au Quebec.* **10**(2): 145–150.
- 42 Laurent A & Chahraoui K (2012). L'impact du stress professionnel sur les intervenants SMUR. *Prat Psychol.* **18**(4): 413–428.
- 43 Leroy-Frémont N, Desrumaux P, & Moundjiegout T (2014). Les effets des demandes au travail et de la justice organisationnelle sur l'épuisement professionnel : Quels effets médiateurs du soutien social et de l'estime de soi? *Prat Psychol.* **20**(4): 231–248.
- 44 Lissandre S, Abbey-Huguenin H, Bonnin-Scaon S, Arsene O, Colombat P (2008). Facteurs associés au burnout chez les soignants en oncohématologie. *Oncologie.* **10**(2): 116–124.
- 45 Lourel M, Gana K, Prud'Homme V, Cercle A (2004). Le burn-out chez le personnel des maisons d'arrêt : Test du modèle «demande-contrôle» de Karasek. *L'encéphale.* **30**(6): 557–563.
- 46 Lupien SJ, McEwen BS, Gunnar MR, Heim C (2009). Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nat Rev Neurosci.* **10**(6): 434–445.
- 47 Martin F, Poyen D, Boudierlique E, Gouvernet J, Rivet B, Disdier P, et al. (1997). Depression and burnout in hospital health care professionals. *Int J Occup Environ Health.* **3**(3): 204–209.
- 48 Maslach C & Jackson SE (1981). The measurement of experienced burnout. *J Organ Behav.* **2**(2): 99–113.
- 49 Maslach C, Jackson SE, Leiter MP, Schaufeli WB, Schwab RL (1986). *Maslach burnout inventory* (Vol. 21). Consulting psychologists press Palo Alto, CA.
- 50 Mion G, Libert N, Journois D (2013). Facteurs associés au burnout en anesthésie-réanimation. Enquête 2009 de la Société française d'anesthésie et de réanimation. *Ann Fr Anesth Réanim.* **32**(3): 175–188.
- 51 Niedhammer I (2002). Psychometric properties of the French version of the Karasek Job Content Questionnaire : A study of the scales of decision latitude, psychological demands, social support, and physical demands in the GAZEL cohort. *Int Arch Occup Environ Health.* **75**(3): 129–144.

- 52 Niedhammer I, Chastang J-F, Levy D, David S, Degioanni S (2007). Exposition aux facteurs psychosociaux au travail du modèle de Karasek en France : Étude méthodologique à l'aide de l'enquête nationale Sumer. *Travailler*. **1**: 47–70.
- 53 Niedhammer I, Ganem V, Gendrey L, David S, Degioanni S (2006). Propriétés psychométriques de la version française des échelles de la demande psychologique, de la latitude décisionnelle et du soutien social du «Job Content Questionnaire» de Karasek : Résultats de l'enquête nationale SUMER. *Santé Publique*. **18**(3): 413–427.
- 54 Niedhammer I & Siegrist J (1998). Psychosocial factors at work and cardiovascular diseases : Contribution of the Effort-Reward Imbalance model. *Revue D'épidémiologie et de Santé Publique*. **46**(5): 398–410.
- 55 Peter R & Siegrist J (2000). Psychosocial work environment and the risk of coronary heart disease. *Int Arch Occup Environ Health*. **73**(1): S41–S45.
- 56 Rakotondrainibe A, Randriamizao HMR, Ratsimbazafy NS, Mong-Gine Y, Rakotoarison CN, Rakototiana FA, Ravalisoa MLA (2018). Burnout syndrome et ses facteurs chez les médecins de deux centres Hospitalo-Universitaires d'Antananarivo. *The Pan African Medical Journal*. **31**: 63
- 57 Rivière A, Commeiras N, Loubès A (2013). Tensions de rôle et stratégies d'ajustement : Une étude auprès de cadres de santé à l'hôpital. *Journal de gestion et d'économie médicales*. **31**(2): 142–162.
- 58 Rizzo JR, House RJ, Lirtzman SI (1970). Role conflict and ambiguity in complex organizations. *Adm Sci Q*. **15**: 150–163.
- 59 Schnall PL, Landsbergis PA, Baker D (1994). Job strain and cardiovascular disease. *Annu Rev Public Health*. **15**(1): 381–411.
- 60 Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. (2012). Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med*. **172**(18): 1377–1385.
- 61 Theorell T & Karasek RA (1996). Current issues relating to psychosocial job strain and cardiovascular disease research. *J Occup Health Psychol*. **1**(1): 9.
- 62 Theorell T, Karasek RA, Eneroth P (1990). Job strain variations in relation to plasma testosterone fluctuations in working men—a longitudinal study. *J Intern Med*. **227**(1): 31–36.
- 63 Tripodi D, Keriven-Dessomme B, Lombrail P, Lacouture MB, Chabot AS, Houdebine MT, et al. (2007). Evaluation des risques professionnels perçus chez le personnel du centre hospitalo-universitaire de Nantes. *Arch des Mal Prof et de l'Environnement*. **68**(5): 457–473.
- 64 Van der Doef M & Maes S (1999). The job demand-control (-support) model and psychological well-being : A review of 20 years of empirical research. *Work & Stress*. **13**(2): 87–114.
- 65 West CP, Tan AD, Habermann TM, Sloan JA, Shanafelt TD (2009). Association of resident fatigue and distress with perceived medical errors. *JAMA*. **302**(12): 1294–1300.
- 66 Zavidovique L, Gilbert F, Vercambre-Jacquot M-N (2018). Bien-être au travail et qualité de vie des enseignants : Quelles différences selon l'ancienneté? *Arch des Mal Prof et de l'Environnement*. **79**(2): 105–119.