

**Work-related stress: volunteer and employee drivers/rescuers**

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## **Abstract**

**Introduction:** In the health field, volunteer staff, unpaid and not moved by economic reasons, support more often the workers, sharing the same stressful factors. The study aims to assess subjective stress by comparing 119 volunteer drivers/rescuers and 119 employee drivers/rescuers, belonging to a big Italian healthcare company.

**Materials and Methods:** Stress was evaluated through the "questionnaire-indicating tool" validated by HSE (Health and Safety Executive). The research was conducted on a working population of 119 employee rescuers/drivers made comparable as for sex and age ( $p = 0.8831$ ) to 119 volunteer rescuers/drivers.

**Results:** Our study showed a critical situation in the fields "Demand", "Control" and "Relationship" for the employee rescuers drivers and in the fields "Demand" and "Relationship" for the volunteer rescuers drivers.

The main differences were in "Control" and "Support from managers" between the two groups.

On the basis of gender, employee women had a more critical situation than men in "Control" and "Change"; the same situation was observed for volunteer women only in "Control".

**Discussion:** Our study shows that the employee drivers/rescuers had a performance worse than the volunteers in "Support from managers" and "Control".

Volunteers and employees had a negative performance in "Demand" and "Relationship".

Women showed critical conditions in "Control" and, only employees, in "Change".

**Key words:** employee drivers/rescuers, health workers, indicator tool, subjective stress, volunteer drivers/rescuers, work-related stress.

## **Introduction**

In the last decades, deep changes radically modified the organizational and productive structure of the working world.

Parallel to these changes, the psychosocial risk factors, which are those aspects of the content and the context of work that cause stress (1), assumed greater and greater importance in the workplace.

Currently, stress is defined as a non-pathologic response of adaptation of the organism against external stimuli of different nature (2).

It affects more than a fifth of European Union workers, representing the second most common work-related health problem, affecting about 22% of EU-27 workers (3).

Although stress represents a physiological process of adaptation to environmental solicitations, when these exceed the capacities of the subject to cope with them, it manifests what it is called distress. There is in fact also the opposite condition characterized by the presence of eustress when the subject experiences an effective adaptation to external stimuli.

Health workers are a working group particularly subject to work-related stress, due to the peculiarity of their job (4).

Several factors could act as stressors in the complex workplace of the health care workers:

- psychological pressure from superiors, from patients and from family ;
- overload work (5-9);
- prolonged working time (6, 7);
- uncooperative and / or "difficult" patients (10, 11);
- night work (12, 13);
- perception of a risk to themselves in the workplace (14);
- limited free time to spend on after work activities (8, 15, 16);
- limited support from colleagues (17);
- to have few days off (12);
- organizational constraints (18);
- hierarchical scale (highest stress in the leader workers and in the youngest and inexperienced) (19);
- having to give bad news to patients and having to cope with their suffering (20);
- low social support (9);
- low decision making authority (21);
- little economic resources in the structure where they work (22).

In the health field, the workers directly dependent on the health structures, are more and more frequently supported, by other unpaid workers, that is volunteers, who carry out their work for non-economic reasons and who sometimes represent a significant percentage of the health staff.

The European Agency for Safety and Health at Work (23) defines the work-related stress as a condition that "occurs when the demands in the workplace exceed the employees' ability to cope with it".

In the assessment of this work-related stress, it is crucial to identify the factors that generate it and increase it in order to identify the categories of subjects at risk and to plan interventions of prevention, elimination or reduction of risk.

The necessity of assessing the risk of work-related stress arises from the fact that it can lead to the onset, in the long term, of pathogenic consequences able to affect not only the workers' health, but also the satisfaction of the patients, and the performance and the efficiency of the company (24).

The analysis of the literature data showed that for the assessment of work-related stress we can use: physiological and biological methods (catecholamines, cortisol, heart rate, blood pressure), epidemiological methods (assessing sick leave), objective and subjective stress evaluations (25-28).

Subjective stress assessment is carried out through the use of questionnaires, which search for potential sources of stress, identify the risk factors, assess the working organization, identify protective factors or factors able to reduce the degree of stress.

We use the HSE questionnaire, which allows us to investigate the subjective causes of stress in a simple and quick way, even on large and different working populations.

The purpose of this study is to assess the subjective distress by comparing 119 volunteer drivers/rescuers and 119 employee drivers/rescuers, belonging to a large Italian healthcare company.

Stress is assessed by the administration of the HSE "indicator tool", composed of 35 item.

This tool allows us to investigate and compare the different perception of stress, both in the employee group and in the group of volunteers, focusing on the seven fields identified by the questionnaire.

## **Materials and methods**

For the assessment of the subjective stress, it was used the "questionnaire-indicating tool" validated by HSE (Health and Safety Executive) (29) consisting of 35 items. It is

an easily administered questionnaire and a guarantee of anonymity, usable in all companies with more than 10 workers, compatible with the indication for the assessment of work-related stress and in compliance with the Italian regulations in force, because it provides results related to groups of workers and not to individual workers (30).

The initial sample of employee drivers/rescuers consisted of 161 subjects, of which 119 have correctly filled out the questionnaire. From an initial population of 366 volunteer drivers/rescuers, we excluded those who had not properly filled out the questionnaire and were selected 119 volunteers, paired by sex and age to the employees.

The research was carried out on a working population of 119 employee drivers/rescuers made comparable by gender and age ( $p = 0.8831$ ) to 119 volunteer drivers/rescuers, belonging to the same big Italian healthcare company.

In the category of employee drivers/rescuers there were 88 men aged between 20 and 70 years (mean: 46.42; SD: 9.21) and 31 women aged between 30 and 65 years (mean: 47.38 ; DS: 8.89); in the category of voluntary drivers/rescuers there were 88 men aged between 20 and 70 years (mean 46, SD: 9.23) and 31 women aged between 30 and 54 years (mean: 47; DS: 8, 97).

The study was conducted in the period between November 2015 and June 2016.

A driver/rescuer is the operator who, as a result of the certificate of qualification obtained pursuant to the Italian legislation, is authorized to carry out the following activities: conducting health emergency vehicles equipped with acoustic alarm signalers and bright blue flashing lights maintenance of the safety of the occupants of such vehicles; maintenance of efficiency and safety of the rescue vehicle entrusted; collaboration in the intervention of health assistance in the various stages of its development with particular attention to safety measure.

The employee drivers/rescuers worked for 5 days a week, for a total of 36 weekly working hours, voluntary drivers/rescuers worked for about a third compared to the employees.

The questionnaire was administered during the surveillance health visits required by current legislation and it was self-compiled. The administration of the questionnaire is preceded by compiling a short survey form of socio-demographic data. The characteristics of the HSE indicator tool is in Tomei et al 2016 (4).

The questionnaire investigates the workers' subjective perception of stress in the last 6 months.

238 questionnaires were used for the research, all suitable for inclusion in the analysis of the data.

We evaluated, for the purpose of the study, the total results for the two categories, the performance of individual items for each of the different dimensions reviewed. Finally, the assessment was repeated by dividing the results obtained, in both men and women, to highlight any difference related to gender.

### **Data analysis**

The data obtained from the questionnaire were analyzed using the specific HSE software, which allows the comparison with the reference population and the production of a table with a numerical value and its reference color ("color code") for each of the six fields (29). The HSE software processes automatically the data, by calculating the percentiles and allows you to compare the organizational performance in the job stress management correlated with ideal conditions/states to gain.

**For each color obtained, a symbol is chosen:**

**▲ = green**

**□ = blue**

**▼ = yellow**

**Δ = red**

Red indicates a serious situation that requires immediate corrective action, and whose values are below the 20th percentile.

Yellow indicates a clear need for corrective action, that is characterized by values below average but above the 20th percentile.

Blue color indicates the presence of a good level of performance that nevertheless requires interventions, with a score between the 50th and the 80th percentile.

Green indicates an optimal situation with satisfaction of the management standard with a score higher than the 80th percentile, and to be maintained over time.

For each working population, both genders have been analyzed, firstly together and then separately.

All workers agreed with the processing of their personal data, stating their awareness of the presence of "sensitive data"; they agreed to treat the data obtained by the protocol in an anonymous and collective way, through scientific procedures, according to the principles of the Helsinki Declaration.

### **Results**

#### **Total results by category**

In the drivers/rescuers employees population examined, the ideal standard (green area) is achieved for the fields "Support from colleagues", "Role" and "Change". The fields "Demand", "Control" and "Relationships" are far from the standard, while "Support from managers" is near the standards (score between the 50 th and the 80 th percentile, blue area) (Table 1).

	<b>EMPLOYEE</b>		<b>MEN</b>		<b>WOMEN</b>	
<b>Demand</b>	<b>2,38</b>	<b>Δ</b>	<b>2,40</b>	<b>Δ</b>	<b>2,32</b>	<b>Δ</b>
<b>Control</b>	<b>3,14</b>	<b>Δ</b>	<b>3,26</b>	<b>▼</b>	<b>2,82</b>	<b>Δ</b>
<b>Managers' Support</b>	<b>3,49</b>	□	<b>3,50</b>	□	<b>3,47</b>	□
<b>Peer Support</b>	<b>4,19</b>	<b>▲</b>	<b>4,25</b>	<b>▲</b>	<b>4,02</b>	<b>▲</b>
<b>Relationships</b>	<b>1,96</b>	<b>Δ</b>	<b>1,94</b>	<b>Δ</b>	<b>2,02</b>	<b>Δ</b>
<b>Role</b>	<b>4,59</b>	<b>▲</b>	<b>4,60</b>	<b>▲</b>	<b>4,56</b>	<b>▲</b>
<b>Change</b>	<b>3,52</b>	<b>▲</b>	<b>3,62</b>	<b>▲</b>	<b>3,22</b>	□

**Table 1: HSE DRIVERS/RESCUERS EMPLOYEES**

In the drivers/rescuers volunteers population, the ideal standard are achieved in the areas of "Support from managers", "Support from colleagues", "Role" and "Change" (score higher than the 80th percentile), the field of "Control" falls in the blue area, while the fields "Demand" and "Relationships" are critical, falling in the red area (Table 2).

	<b>VOLUNTEERS</b>		<b>MEN</b>		<b>WOMEN</b>	
<b>Demand</b>	<b>2,28</b>	<b>Δ</b>	<b>2,30</b>	<b>Δ</b>	<b>2,21</b>	<b>Δ</b>
<b>Control</b>	<b>3,56</b>	□	<b>3,62</b>	□	<b>3,41</b>	<b>▼</b>
<b>Managers' Support</b>	<b>4,01</b>	<b>▲</b>	<b>4,01</b>	<b>▲</b>	<b>3,99</b>	<b>▲</b>
<b>Peer Support</b>	<b>4,20</b>	<b>▲</b>	<b>4,19</b>	<b>▲</b>	<b>4,23</b>	<b>▲</b>
<b>Relationships</b>	<b>1,86</b>	<b>Δ</b>	<b>1,87</b>	<b>Δ</b>	<b>1,85</b>	<b>Δ</b>
<b>Role</b>	<b>4,38</b>	<b>▲</b>	<b>4,36</b>	<b>▲</b>	<b>4,42</b>	<b>▲</b>
<b>Change</b>	<b>3,91</b>	<b>▲</b>	<b>3,89</b>	<b>▲</b>	<b>3,96</b>	<b>▲</b>

**Table 2: HSE DRIVERS/RESCUERS VOLUNTEERS**

## **Results of each item by category**

### **Employees**

In the drivers/rescuers employees, the field of the "Support from managers" achieved an overall score between the 50th and the 80th percentile (blue area). Only two of the

five questions of this field, that is: "I can talk to my line manager about something that has upset or annoyed me about work " and "My line manager encourages me at work", obtained a score lower than the 20th percentile, falling in the red area.

The field "Demand" achieved a total score lower than the 20th percentile (red area). Even though this result constitutes a situation which requires immediate action, it should be noted that two of the eight items of this area, that is: "I have to work very intensively" and "I have to work very fast", got a higher score at the 80th percentile (green area).

The field of "Change" achieved an overall score above the 80th percentile (green area); in this field, the single question "I have sufficient opportunities to question managers about change at work" got a score between the 50th and the 80th percentile, falling in the blue area.

### **Volunteers**

In the group of volunteers drivers/rescuers, the field "Demand" had an overall score below the 20th percentile (red area). Analyzing each item belonging to this area, we can see that two of the eight questions obtained a total score above the 80th percentile (green area): the questions are "I have to work very intensively" and "I have to work very fast".

The field "Support from managers" obtained an overall score higher than the 80th percentile (green area). Even though, the question on the encouragement by the managers falls into the red area.

The field "Role" achieved an overall score higher than the 80th percentile, but the question "I understand how my work fits into the overall aim of the organization" falls into the red area.

In the field "Change", the ideal standard is achieved in all items.

### **Analysis of total results and of each item by gender and category**

#### **Employees**

The evaluation of results was repeated to highlight any differences after division by gender.

In the sample of employees divided by gender we did not observe significant differences in the overall results in the field "Demand", "Support from managers", "Support from colleagues", "Relationships" and "Role", while there are differences in the fields "Control" (red for women, yellow for men) and "Change" (blue for women, green for men).



In the field "Control", between men and women there are differences with regard to the individual items, especially in relation to the questions: "I have a say in my own work speed" (blue area for men and red for women) and "I have a choice in deciding what I do at work" (blue area for men and red for women).

In the field "Support from the managers", we found the most significant difference in the question "I can rely on my line manager to help me out with a work problem" (blue area for women and yellow for men) and "I can talk to my line manager about something that has upset or annoyed me about work" (yellow area for women and red for men).

The field "Support from colleagues" obtained for men a great level of performance, while for women the questions "I get help and support I need from colleagues" and "My colleagues are willing to listen to my work-related problems" relapsed in blue area, achieving a score between the 50th and 80th percentile.

In the field "Relationships", both groups achieved a score, for each item and totally, below the 20th percentile; in particular, the question "I am subject to bullying at work" reveals a significantly critical situation in both genders.

In each item of the field "Role", we found a difference in the question about goals or objectives of work, with a score between the 20th and the 50th percentile in women (yellow area) and a score above the 80th percentile in men (green area).

In the field "Change", there is a significant difference between men and women has to the questions: "I have sufficient opportunities to question managers about change at work" (red area for women, blue for men) and "Staff are always consulted about change at work" (blue area for women, green for men).

### **Volunteers**

In the volunteers drivers/rescuers population, the overall scores in the individual fields are the same for the two genders in the field "Demand" (red area), "Support from managers" (green area), "Support from colleagues" (green area), "Relationships" (area red), "Role" (green area) and "Change" (green area), while they are different in the field "Control" (blue for men and yellow for women).

In the field "Demand", the results of individual items do not show any difference between the genders.

As to the field "Control", we found significant differences between men and women in the questions: "I have a say in my own work speed" (green area for men and red area for women) and "I have some say over the way I work" (blue area for men and red for women).

In the field "Support from managers", there is no difference in the overall results and in the results for the individual items (green area for both).

In the field "Support from colleagues", the scores for each item in males and females are the same (all in the green area).

In the overall scores and in the individual item of the field "Relationships", there is no difference, but the question "I am subject to bullying at work" results in both genders a significantly critical situation.

The field "Change" showed no difference in the individual items between the two groups (green area for all items).

## **Discussion**

Drivers/rescuers are a category of workers at high-risk group for the development of work-related stress (4, 5, 12, 13).

Many factors related to the context and the kind of the work, influence the development and perpetuation of a stress condition.

Our research shows that, in the field "Demand", the two groups have a similar overall score, falling into the red area. We may consider that this result is linked to the heavy workload and the kind of tasks often not suited to their abilities, which could be a cause of dissatisfaction and, sometimes, lead to interruption of the working activity (5, 6, 12, 14, 31, 32). Even though this situation can lead to take targeted strategies, the workers of both groups achieve a score higher than the 80th percentile in two of the eight items of this area, as it emerges in our results denoting they are not subject to intense and very fast work.

Although volunteers work fewer hours compared to employees, they are still subject to work-related stress because of the workload concentrated in time, because of the increased frequency of night shifts and the less organized work compared to the employee workers.

In the field "Control" the results falls in the red area for employees and in the blue area for volunteers.

Actually, an important factor for the onset of occupational stress is the lack of decision-making autonomy and the lack of autonomy on how to approach users because of the peculiar pyramidal structure of subordinate employment. Though follow in the provisions imposed by managers, volunteers have more autonomy (11, 21, 22, 32).

A study conducted by Argentero et al showed that health care employee operators suffer psychological pressure regarding decision-making processes more than volunteers, showing less involvement and more frequent burnout syndrome (32).

The group of employee drivers/rescuers obtained a score between the 50th and the 80th percentile (blue area) in the field "Support from managers"; by analyzing the individual items, the results suggest that the lack of encouragement from the boss is a significant source of stress for both groups (red area), while the opportunity to talk to the boss, in the event that labor issues occur appears to be a cause of occupational stress only for employees. The scientific literature documents that some of the main factors causing work-related stress are the lack of support from the managers, the psychological pressure of managers and the duty to submit to a hierarchy (5, 19). In addition, the lack of encouragement and support from colleagues are a significant source of stress too (33); while, the measures for the management and the communication and collaboration between colleagues, are preventive strategies to reduce the occurrence of physical and emotional tension at work (34).

Our results show that, in the field "Support from colleagues", the ideal situation is reported; satisfaction of standard management (overall score above the 80th percentile), both for volunteers and employees; we obtained this result for males and females of both groups and for each item of the area. This result encourages to maintain a work environment characterized by collaboration and dialogue (5, 34).

The field "Relationships" obtained in both groups a score below the 20th percentile; in particular, the question "I am subject to bullying at work" reveals in both groups a significantly critical situation, in fact 97.5% of the workers interviewed, answered "sometimes", "often" or "always", as literary studies reported (5).

Our study showed that both groups scored above the 80th percentile in the field "Role" and "Change". This situation must be maintained over time, as it is clear that a poor understanding of the individual role and responsibilities as well as the lack of involvement in decision-making in a case of organizational changes, represent a source of internal conflict at work (18, 21). In the field "Role" volunteers workers showed same difficulties because our results show that, despite the good overall level, the item on the understanding of the general aims of the organization, fell in red area. Job satisfaction and promotion of personal and social resources are strategies that can be implemented in order to reduce stress (35, 36).

As regards the distinction between the two genders, our study shows that the drivers/rescuers female employees and volunteers got less positive results than men

in the fields "Control" and "Change". While in the other areas, female performed the overall scores were similar. In the field of "Control" the items that underlined major differences between men and women were: "I have a say in my own work speed" (blue area for men and red for women) and "I have a choice in deciding what I do at work" (blue area for men and red for women); these results seem to be related to little disposition to organizational change and decision-making autonomy of women, because of their dual role, at work and at home and even the presence of too many men in leadership roles (37-42). In the group of volunteers, men got a worse performance on the question "My working time can be flexible" (blue area for men and green for women), because they are less prone to vary their working hours in relation to family needs.

In the field "Support from managers" the questions "I can rely on my line manager to help me out with a work problem" turned out in the blue area for women and in the yellow area for men and the question "I can talk to my line manager about something that has upset or annoyed me about work" in the yellow area for women and in the red area for men. The literature shows that men suffer mostly of the company hierarchical structure and, consequently, rarely turn to their superiors for issues concerning the work activities (19).

In the field "Role", a difference appeared in the question about the goals or aims of the work department, with a score between the 20th and the 50th percentile in women (yellow area), and a score above the 80th percentile in men (green area) (36).

Among the volunteers, the two genders achieved similar overall scores matched, except in "Control" where women achieved an overall score between the 20th and 50th percentile, while men got a score between the 50th and the 80th percentile, documenting that women have a lack of autonomy on how to carry out their work.

The results obtained showed that despite they work less than the employees, the volunteers are also subjected to work-related stress. This result suggests that additional future efforts should be focused on finding correlations between the kind of work and the conditions in which this work is to be carried out also considering additional variables (blood pressure, b.m.i., alcohol intake and cigarette smoking) in this category of workers, because the analysis of the literature shows that few studies have focused on the assessment of stress in volunteer health workers. Furthermore, this study aims to help the Occupational physicians to assess the stress in job categories not yet been sufficiently investigated as those of volunteers.

## References

- 1) Hacker W. 1991. Objective work environment: analysis and evaluation of objective work characteristics. Paper presented to: A Healthier Work Environment: Basic Concepts & Methods of Measurement. Hogberg, Lidingo, Stockholm.
- 2) Selye H. 1956. The stress of life. McGraw-Hill Book Co, New York.
- 3) European Agency for Safety and Health at Work. 2009. OSH in figures: stress at work — facts and figures. Luxembourg: Office for Official Publications of the European Communities. Available at: [https://osha.europa.eu/en/tools-and-publications/publications/reports/TE-81-08-478-EN-C\\_OSH\\_in\\_figures\\_stress\\_at\\_work](https://osha.europa.eu/en/tools-and-publications/publications/reports/TE-81-08-478-EN-C_OSH_in_figures_stress_at_work)
- 4) Tomei G, Ricci S, Fidanza L, et al. Work-related stress in healthcare workers. *Ann Ig* 2016; 28: 36-49.
- 5) Averlid G, Axelsson SB. Health-promoting collaboration in anesthesia nursing: a qualitative study of nurse anesthetists in Norway. *AANA J* 2012; 80: S74-S80.
- 6) Rutledge T, Stucky E, Dollarhide A, et al. A real-time assessment of work stress in physicians and nurses. *Health Psychol* 2009; 28: 194-200.
- 7) Suresh P, Matthews A, Coyne I. Stress and stressors in the clinical environment: a comparative study of fourth-year student nurses and newly qualified general nurses in Ireland. *J Clin Nurs* 2013; 22: 770-779.
- 8) Flowerdew L, Brown R, Russ S, et al. Teams under pressure in the emergency department: an interview study. *Emerg Med J* 2012; 29: e2.
- 9) Malinauskiene V, Leisyte P, Romualdas M, et al. Associations between self-rated health and psychosocial conditions, lifestyle factors and health resources among hospital nurses in Lithuania. *J Ad Nurs* 2011; 67: 2383-2393.
- 10) Boran A, Shawaheen M, Khader Y, et al. Work-related stress among health professionals in northern Jordan. *Occup Med (Lond)* 2012; 62: 145-147.
- 11) De Andrés-García S, Sariñana-González P, Romero-Martínez A, et al. Cortisol response to stress in caregivers of offspring with autism spectrum disorder is associated with care recipient characteristics. *Stress* 2013; 16: 510-519.
- 12) Györfy Z, Adám S. Somatic and mental morbidity of young female physicians. Does emotional exhaustion constitute the missing link? *Orv Hetil* 2013; 6: 20-27.
- 13) Wong IS, Ostry AS, Demers PA, et al. Job strain and shift work influences on biomarkers and subclinical heart disease indicators: a pilot study. *J Occup Environ Hyg* 2012; 9: 467-477.
- 14) Golubic R, Milosevic M, Knezevic B, et al. Work-related stress, education and work ability among hospital nurses. *J Adv Nurs* 2009; 65: 2056-2066.

- 15) McClelland LE, Switzer FS 3rd, Pilcher JJ. Changes in nurses' decision making during a 12-h day shift. *Occup Med (Lond)* 2013; 63: 60-65.
- 16) Tomei G, Di Marzio A, Sacco C, et al. Stress in athletes. *Prevent Res* 2015; 4: 75-79.
- 17) Altounji D, Morgan H, Grover M, et al. A self-care retreat for pediatric hematology oncology nurses. *J Pediatr Oncol Nurs* 2013; 30: 18-23.
- 18) Kath LM, Stichler JF, Ehrhart MG, et al. Predictors and outcomes of Nurse Leader job stress experienced by AWHONN members. *J Obstet Gynecol Neonatal Nurs* 2013; 42: E12-E25.
- 19) Hayasaka Y, Nakamura K, Yamamoto M, et al. Work environment and mental health status assessed by the general health questionnaire in female Japanese doctors. *Ind Health* 2007; 45: 781-786.
- 20) Sehlen S, Vordermark D, Schäfer C, et al. Job stress and job satisfaction of physicians, radiographers, nurses and physicists working in radiotherapy: a multicenter analysis by the DEGRO Quality of Life Work Group. *Radiat Oncol* 2009; 6: 6.
- 21) Adriaenssens J, De Gucht V, Van Der Doef M, et al. Exploring the burden of emergency care: predictors of stress-health outcomes in emergency nurses. *J Adv Nurs* 2011; 67: 1317-1328.
- 22) Zaghloul AA, Abou El Enein NY. Nurse stress at two different organizational settings in Alexandria. *J Multidiscip Healthc* 2009; 15: 45-51.
- 23) European Agency for Safety and Health at Work. 2000. Research on Work-related Stress. Luxembourg: Office for Official Publications of the European Communities. Available at: <https://osha.europa.eu/en/tools-and-publications/publications/reports/203>
- 24) Li L, Hu H, Zhou H, et al. Work stress, work motivation and their effects on job satisfaction in community health workers: a cross-sectional survey in China. *BMJ Open* 2014; 4: e004897.
- 25) Massoni F, Simeone C, Ricci P, et al. Papillary thyroid carcinoma and medicolegal considerations. *Minerva Med.* 2013; 104: 493-494.
- 26) Tomei F, Di Marzio A, Suppi A, et al. Work-related stress and cardiovascular effects. *Prevent Res* 2016; 5: 61-65.
- 27) Massoni F, Ricci P, Simeone C, Ricci S. Cardiac death in aortic valve sclerosis and coronary artery disease. An autopsy report. *Acta Medica Mediterr* 2014; 30: 77-80.

- 28) Ricci S, Massoni F, Di Meo M, et al. Correlation among measures of stress, indicators of biohumoral nature and medico-legal considerations. *Riv Psichiatr* 2013; 48: 113-120.
- 29) HSE. 2007. HSE Analysis Tool for Work Related Stress. Available at: [www.hse.gov.uk/stress/standards/pdfs/analysistool.xls](http://www.hse.gov.uk/stress/standards/pdfs/analysistool.xls)
- 30) Iavicoli S, Natali E, Rondinone BM, et al. Contestualizzazione e validazione in Italia del modello Management Standards HSE quale contributo all'individuazione delle indicazioni per la valutazione dello stress lavoro correlato. *G Ital Med Lav Erg* 2010; 32: 130-133.
- 31) Feeney S, O'Brien K, O'Keeffe N, et al. Practise what you preach: health behaviours and stress among non-consultant hospital doctors. *Clin Med (Lond)* 2016; 16: 12-18.
- 32) Argentero P, Bonfiglio NS, Pasero R. Burnout in volunteer health workers. *G Ital Med Lav Ergon* 2006; 28: 77-82.
- 33) Shin SY, Lee SG. Effects of Hospital Workers' Friendship Networks on Job Stress. *PLoS One* 2016; 11: e0149428.
- 34) St Ledger U, Begley A, Reid J, et al. Moral distress in end-of-life care in the intensive care unit. *J Adv Nurs* 2013; 69: 1869-1880.
- 35) Nam SJ, Chun HJ, Moon JS, et al. Job Stress and Job Satisfaction among Health-Care Workers of Endoscopy Units in Korea. *Clin Endosc* 2016; 49: 266-272.
- 36) Golbasi Z, Kelleci M, Dogan S. Relationships between coping strategies, individual characteristics and job satisfaction in a sample of hospital nurses: cross-sectional questionnaire survey. *Int J Nurs Stud* 2008; 45: 1800-1806.
- 37) Andolhe R, Barbosa RL, Oliveira EM, et al. Stress, coping and burnout among Intensive Care Unit nursing staff: associated factors. *Rev Esc Enferm USP* 2015; 49: 58-64.
- 38) Kan D, Yu X. Occupational Stress, Work-Family Conflict and Depressive Symptoms among Chinese Bank Employees: The Role of Psychological Capital. *Int J Environ Res Public Health* 2016; 13.pii: E134.
- 39) Tomei G, Sancini A, Capozzella A, et al. Perceived stress and stress-related parameters. *Ann Ig* 2012; 24: 517-526.
- 40) Tomei G, Ciarrocca M, Scimitto L, et al. Mental health and women's work: Is balance possible? *Minerva Psichiatrica* 2012; 53: 79-89.

- 41) Sancini A, Tomei F , Schifano MP, et al. Stress characteristics in different work conditions: Is it possible to identify specificity of risk factors by the questionnaire method? Eur J Inflamm 2010; 8: 117-23.
- 42) Tomei G, Rosati MV, Ciarrocca M, et al. Anxiety, musculoskeletal and visual disorders in video display terminal workers. Minerva Med 2006; 97: 459-466.