

# Perceived occupational hazards among cash-in-transit guards

Percepção dos riscos profissionais em trabalhadores de transporte de valores

Sara Ramos<sup>1</sup> , Florentino Serranheira<sup>2</sup> , António Sousa-Uva<sup>2</sup> 

**ABSTRACT | Background:** Given reports of health complaints by cash-in-transit (CIT) guards to their trade union, we conducted a study at private security companies. **Objectives:** To establish the health and safety at work (HSW) conditions to which employees from three companies in Portugal were subjected, characterize their working conditions and tasks, and identify aspects of their activity with influence on their health and safety, as well as self-reported health problems. **Methods:** We performed an exploratory and descriptive study based on a questionnaire with three dimensions corresponding to the study aims. The questionnaire was applied by workers' representatives in the workplace without any participation of employers. **Results:** The job of CIT guards poses several demands as concentration and precision, involves high physical load, atypical schedules, and exposure to emotionally disturbing situations and violence. The workers rated negative the influence of work on their physical and mental health and safety. **Conclusion:** We found considerable variability in working conditions and work demands between the analyzed companies. Such diversity points to the need to intervention on HSW through sensitization toward the legislation in force for the prevention of work-related diseases and accidents.

**Keywords |** safety; occupational risks; risk factors; occupational health.

**RESUMO | Introdução:** Realizou-se um estudo no setor de vigilância privada com vigilantes de transporte de valores (VTVA) diante da presença de queixas de saúde a uma organização sindical do setor. **Objetivos:** Diagnosticar a situação de trabalho desses profissionais, do ponto de vista da saúde e segurança, caracterizando as condições de trabalho e as tarefas desses trabalhadores, identificando elementos da atividade de trabalho com influência em sua saúde e segurança e apontando os principais problemas de saúde autorreportados em três empresas que operam em Portugal. **Métodos:** Efetivou-se um estudo exploratório, de natureza descritiva, recorrendo a um questionário dirigido a trabalhadores com três dimensões, de acordo com os objetivos no contexto da saúde e segurança do trabalho (SST). O questionário foi aplicado nas empresas pelos representantes do sindicato e sem qualquer participação das direções das empresas. **Resultados:** A atividade desses funcionários apresenta exigências diversas, nomeadamente de concentração e precisão, carga física elevada, horários atípicos, exposição a situações emocionalmente fortes e ainda violência. Evidencia-se, por parte dos trabalhadores, influência negativa do trabalho em sua saúde e segurança, tanto no nível físico como no psicológico. **Conclusão:** Identifica-se uma importante variabilidade de condições e exigências do trabalho nas empresas observadas, que determina a necessidade de intervenção no contexto da SST, designadamente por meio de sensibilização sobre a legislação existente no sentido da prevenção das doenças ligadas ao trabalho e também dos acidentes de trabalho.

**Palavras-chave |** segurança; riscos ocupacionais; fatores de risco; saúde do trabalhador.

<sup>1</sup>Departamento de Recursos Humanos e Comportamento Organizacional, Instituto Universitário de Lisboa (ISCTE-IUL) - Lisboa, Portugal.

<sup>2</sup>Departamento de Saúde Ocupacional e Ambiental, Escola Nacional de Saúde Pública, Universidade NOVA de Lisboa (ENSP-NOVA) - Lisboa, Portugal.

DOI: 10.5327/Z1679443520180264

## INTRODUCTION

We performed an action research project with Portuguese private security companies. The study was conducted by a multidisciplinary group of researchers in partnership with a trade union to analyze health and safety at work, and identify occupational risks to which cash-in-transit (CIT) guards are exposed.

Available estimates indicate that private security companies employ about 36,000 workers in Portugal, with a business value of about 650 million euros per year<sup>1</sup>. According to the Private Security Council, the average age of workers is about 40 years old, and 52% of the total manpower is aged 36 to 55. About 91% of employees are male, and only about 1% are not Portuguese citizens. The same source reports that this sector involves about 100 companies, most of them small. The ten largest enterprises employ 72% of workers and represent 88% of sales<sup>2</sup>; the four largest employ about 13,000 workers (37% of the total) and account for 46% of the business<sup>3</sup>.

Private security involves several functions, to wit, airport security, static security, doorman and CIT services. Our study targeted CIT guards, because they are occupationally exposed to hazards likely to interfere with their health and safety. Indeed, CIT guards made complaints relative to their working conditions to the aforementioned trade union, which were the trigger for the present study.

According to the Collective Labor Agreement (CLA)<sup>4</sup> and Law no. 34/2013<sup>5</sup>, CIT guards “handle and transport banknotes, coins, securities and other valuables, and drive armored cash transport cars.” While the normal working time established by law is 8 hours per day and 40 hours per week, it might be extended to 10 daily hours to a maximum of 50 hours per week provided the working hours comply with the shift and rest regimen described in CLA.

According to the trade union, workers’ representatives often report concerns and complaints relative to the health and safety of this population of workers. This fact led to a partnership with researchers from two universities to conduct a study on the working conditions of CIT guards aiming at the prevention of work-related diseases and accidents.

However, the board of the abovementioned four largest companies refused participation, which limited

our access to information on the working conditions of the employees. For this reason, we restricted our focus to activity-centered analysis<sup>6</sup> based on direct observation. Given the circumstances, we chose to investigate the employees’ perception of risk, which usually reflects the characteristics of job activities and their negative impacts (in terms of health and safety)<sup>7</sup>. For this purpose, we applied a questionnaire to employees at several companies to investigate their views on the hazards they perceive in their actual activities, main reported health problems, and the degree in which they related them to their job. Analysis based on workers’ perception is fully justified by the overall assumptions of the ergonomic approach<sup>8</sup>. It is also justified by the relevance of considering the perspective of the individuals who actually perform activities, i.e., the workers, for the purpose of identifying and broadly intervening on risk factors<sup>9</sup>. Previous studies demonstrated the relevance of the workers’ perspective as key stakeholders in prevention. As a result, these studies emphasize the need to include workers in the process of identification and recognition of risk factors and corresponding occupational hazards. Thus the more “technical” views on risk are overcome<sup>9</sup>, by assuming it is not an objective condition of work, but a particular result of the interaction between workers and the risk factors<sup>10</sup> which characterize the working conditions.

## METHODS

### PARTICIPANTS

The sample comprised 131 employees from three companies (among the most representative of the business) being 23 from company A, 45 from B and 63 from C. All were male and professional CIT guards.

### INSTRUMENTS

We adapted a questionnaire<sup>11</sup> — AGE — to include the dimensions needed to gather the information required for the present study. AGE was developed based on several instruments used in Europe: *Enquête Santé, Travail et Vieillesse* (ESTEV)<sup>12</sup>, *Vieillesse, Santé et Travail* (VISAT)<sup>13</sup>, *Santé et Vie Professionnelle après 50 ans* (SVP50)<sup>14</sup>, *Évolutions et Relations en Santé au Travail* (EVREST)<sup>15</sup>, *Swedish Longitudinal Occupational Survey*

of Health/Swedish Work Environment Surveys (SLOSH/SWES)<sup>16</sup>, Saúde, Idade e Trabalho (SIT)<sup>17</sup>, *European Working Conditions Survey* (EWCS)<sup>18</sup>, *Work Ability Index* (WAI)<sup>19</sup>, *Job Demands-Resources Questionnaire* (JD-R)<sup>20</sup>, SUMER<sup>21</sup> and *Enquête Conditions de Travail*<sup>22</sup>. The adapted version included:

- An initial set of questions for general characterization of the working conditions (employment relationship, working hours and schedule);
- A dimension relative to risk factors in the workplace;
- A dimension on work-related health problems.

The first dimension included questions on the characteristics of work. The second dimension investigated the working conditions and risk factors perceived by the participants, which were qualified based on a scale of frequency and degree of discomfort. These aspects were analyzed according to the answers to the following question: “Please, indicate whether you believe that you are exposed to any of the following situations in the workplace. For each situation to which you are exposed indicate the frequency of exposure and the degree of unease/discomfort it causes to you.” The first half of the question was responded on a 4-point Likert scale (1=“never; 4=“always”). The second half — which investigated the degree of unease/discomfort perceived with some frequency in relation to the analyzed exposure — was also responded on a 4-point Likert scale (1=“it doesn’t bother me”; 4=“it bothers me a lot”). Therefore, the higher the score, the higher the level of discomfort felt in the daily work routine.

The dimension on health comprised 18 questions which investigated health problems and their relationship with the working conditions. The respondents were requested to “Please, indicate if you had any of the following health problems in the past 3 years. If you did, indicate whether you believe it is related to your job.” This dimension comprised several categories of health problems, to wit, sleep disorders, gastrointestinal complaints, vision problems, nervousness and irritability. Response options were dichotomous (yes/no). For each affirmative response, the respondents were requested to select one of the three options on the relationship between health problems and work (“no relationship with work,” “aggravated by work” or “caused by work”).

To characterize the sample, the questionnaire included items on sociodemographic variables: age, sex, country of citizenship and educational level. Data were also collected on function at the company, history at the company, company name and location.

## PROCEDURES

The questionnaires were applied by workers’ representatives in the workplace along 4 weeks. The responded questionnaires were delivered to the investigators to be entered for statistical analysis in software Statistical Package for the Social Sciences (SPSS) (version *Statistics 22*). Participation was voluntary, all the participants signed an informed consent form, and the confidentiality of the results was guaranteed — identification data were not required.

## RESULTS

Overall, the participants emphasized that the CIT guard job consists in accomplishing a *mission command* assigned at the beginning of each shift. Assignments are accomplished in pairs, who are given an *armored cash transport car*. The activity begins at the underground level — a high-security environment — where the guards pick the cars up, which they load (with banknotes, coins, gold, jewels or other valuables in bags of up to 20 kg) at the *transfer area*. The load is subjected to *infrared reading* to confirm that the actual amount matches the one described in the mission command, and only then is loaded into the car. All these tasks are performed by CIT guards. Once inside the car, the bags are placed in a vault, which demands squatting, and set according to the order of delivery. In some teams, members alternate between driving and transport, while in others one member is always the driver and the other is exclusively charged of transport. Transport might be done by means of *security aluminum or carbon fiber briefcases* (Intelligent Banknote Neutralization System — *IBNS*) of *variable weight* (11 to 12 kg empty, and up to 4 kg heavier when full) or by *directly carrying strapless bags in the hands* (which demands some degree of handgrip strength). The equipment varies among companies, and there are several models of *INBS briefcases*.

Also routes, workload and schedules vary considerably among companies. On a regular working day, CIT guards visit about

25 customers per shift, which means they get in and out the car about 170 times (about 60 times carrying 20-kg bags of coins, 60 times carrying banknotes, 30 times to load automatic teller machines (ATM) and 20 times without carrying any load to identify the site of destination). The trajectory to be walked carrying loads between customers and the car might vary considerably depending whether the destination is an ATM, a street shop or a shopping mall. In addition to transport, guards are further required to count money, carry bags or briefcases, disassemble the INBS briefcases and put them in the car rack or box. These tasks demand specific movements and application of force involving the upper limbs and the spine.

The details of the activities performed by CIT guards allowed us to conclude that they pose high physical, but also cognitive demands, given the long hours driving and the responsibility associated with their tasks. One should further consider the risk of violence, robbery and threats to the physical integrity of guards, which result in high emotional demands.

The data on self-perceived health problems were highly relevant, and evidenced differences between the three analyzed companies. Overall, the most frequent problems reported (Graphics 1, 2 and 3) were musculoskeletal disorders, which were mentioned by 87% of the sample. Also noteworthy were anxiety, reported by 75% of the participants, easy tiredness or fatigue, 60%, depression symptoms, 65%, and vision problems, 54%. Comparative analysis between companies evidenced substantial variation in these rates.

Company A employees (Graphic 1) reported less health problems overall compared to the other two companies, more particularly less musculoskeletal complaints (78%) and depression symptoms (61%). However, they exhibited a comparatively higher frequency of vision problems (61%). The frequency of anxiety (74%), fatigue (57%) and neurological problems (26%) was higher compared to company B, but lower compared to company C.

Company B employees exhibited higher frequency of a large number of health problems compared to company A, particularly musculoskeletal complaints (82%), depression symptoms (64%), sleep (40%), circulatory (51%) and respiratory (38%) disorders.

Company C employees exhibited the highest rates of musculoskeletal problems (100% reported muscle, joint

or bone problems), depression symptoms (69%), fatigue (71%), memory problems (43%) and gastrointestinal disorders (38%).

The health problems described might be indicative of the specific working conditions in each company. The data on perceived exposure to risk factors (Table 1) evidence the ones most frequently mentioned by the participants, and also differences between the three analyzed companies.

The risk factors emphasized by the participants were: transport of loads, long time standing up, repetitive movements, awkward or uncomfortable posture, unfavorable temperature (hot or cold), noise, vibration, dust and gases, work in a closed environment, handling machines or equipment, and potential exposure to extreme violence.

Based on the risk factors and health problems most frequently mentioned, the role the participants attributed to work as trigger of health complaints is clear, either as cause or factor of aggravation (Graphic 4).

Attribution of the cause of health problems to work was extremely frequent for some particular conditions, to wit, musculoskeletal disorders, tiredness, sleep disorders, nervousness and discouragement.

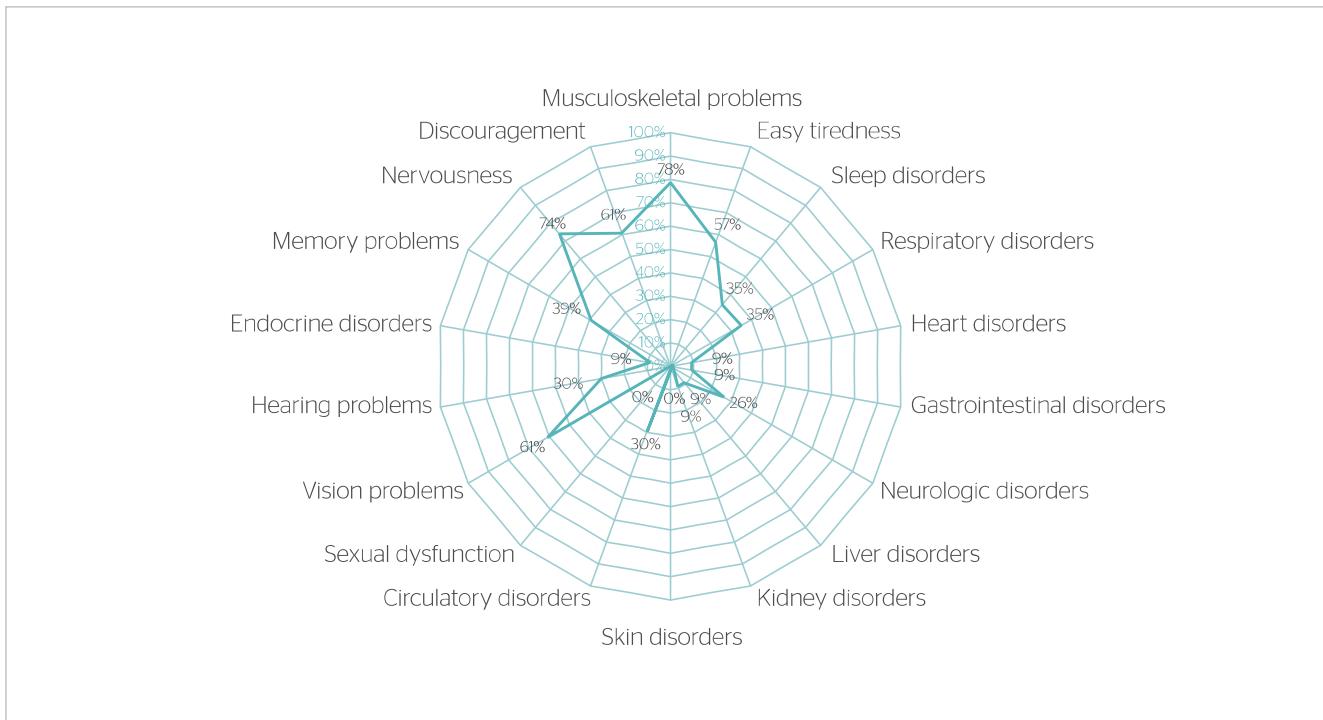
As in the case of the health problems, also differences in the reported exposure to risk factors were evident between the three analyzed companies. This issue is highly relevant, because differences were detected although the function and job description were the same for all three groups of participants. Differences relative to the working conditions that the employers do not seem to take into account, but which influence the employees' self-perception of their health.

## DISCUSSION

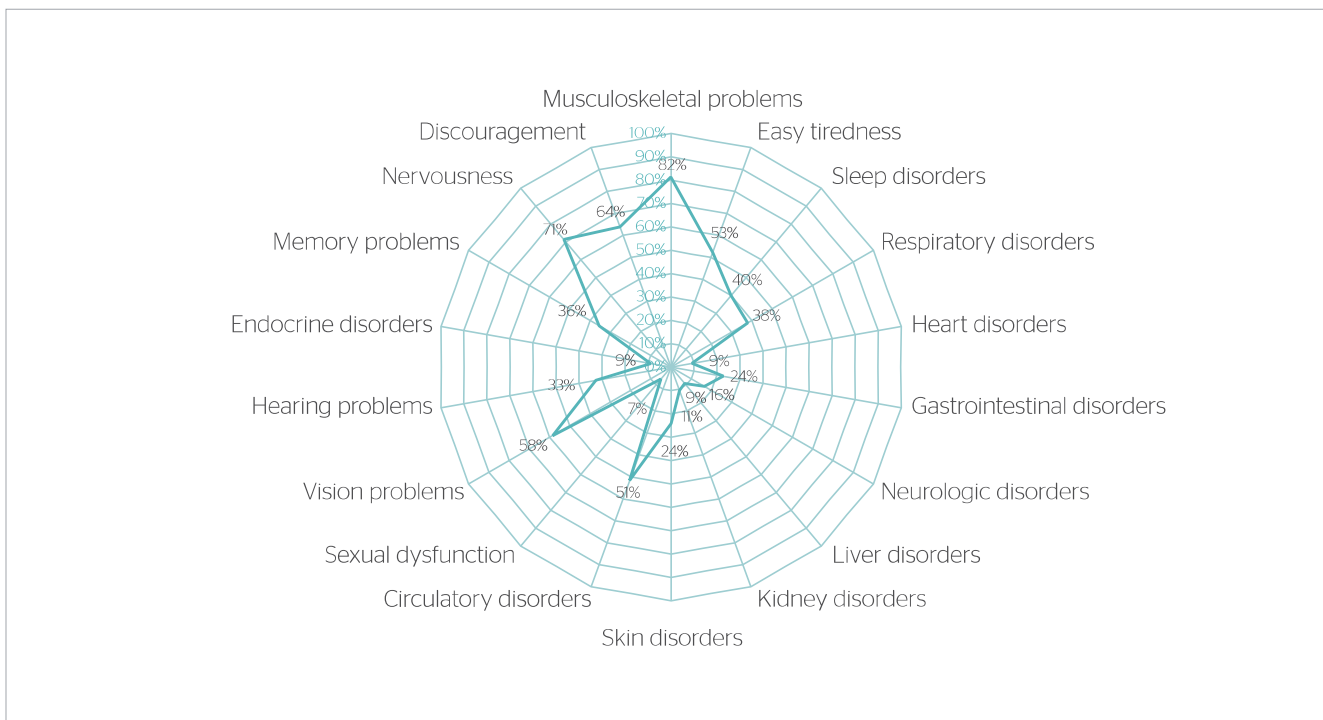
The participants' views seemingly point to insufficient investment and employer involvement in the prevention of occupational risks and health promotion.

According to the results, the participants had a negative perception of the influence of work on their health and safety. This perception concerned specific aspects of their activity, to wit:

- Inadequacy of clothes to the atmospheric conditions, more particularly during some seasons of the year;



**Graphic 1.** Health problems reported by company A employees, Lisbon, 2018 (n=131).



**Graphic 2.** Health problems reported by company B employees, Lisbon, 2018 (n=131).

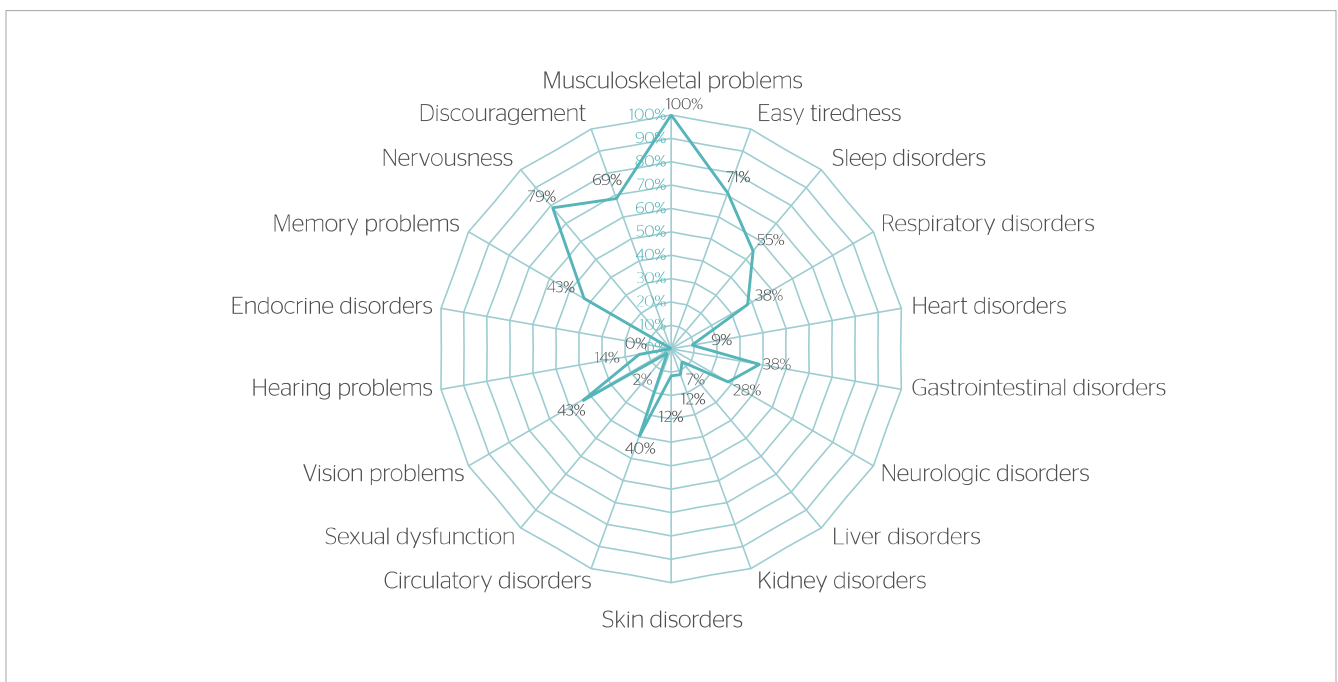
- High physical demands, especially in association with the handling of loads;
- Use of non-ergonomic equipment (IBNS briefcases);
- The conditions inside cars (also different between companies) with hygiene and ventilation problems (some are never cleaned, maintained or lack air conditioning).

We should further observe that a large part of the reported problems—which seemingly most contributed to impair the participants’ well-being — were of psychosocial nature, many of them related to the organization of work. The intensity of work, its pace and perceived pressure result from the organization of work, and might contribute to the occurrence (or worsening) of physical (muscle, joint, vascular problems, tiredness and fatigue) or mental (sleep disorders, stress, anxiety and depression, among others) disorders. These effects on mental health are further potentiated by low social support (and devaluation by supervisors) and exposure to verbal or physical violence (direct contact with customers, risk of robbery or crime).

Beyond the necessary interventions to improve the working conditions, these factors show that the implementation of concrete actions to manage psychosocial

**Table 1.** Perceived exposure to risk factors, Lisbon, 2018 (n=131).

	Company A		Company B		Company C	
Awkward posture	17	74%	29	64%	45	78%
Load transport	23	100%	41	91%	51	88%
Standing up and repetitive movements	21	91%	41	91%	49	84%
Dust, gases, chemicals	13	57%	36	80%	32	55%
X rays	2	9%	6	13%	3	5%
Electrical equipment	12	52%	22	49%	32	55%
Vibration	11	48%	30	67%	31	53%
Noise	17	74%	40	89%	25	43%
Heat or cold	19	83%	36	80%	47	81%
Computers and visual demands	15	65%	29	64%	32	55%
Verbal violence	1	4%	9	20%	11	19%
Garbage and waste	8	35%	19	42%	21	36%
Contact with customers	12	52%	32	71%	38	66%
Extreme violence	22	96%	42	93%	54	93%
Closed environments	21	91%	41	91%	51	88%
Discrimination	0	0%	4	9%	7	12%
Lighting	14	61%	25	56%	25	43%
Machines	19	83%	36	80%	43	74%



**Graphic 3.** Health problems reported by company C employees, Lisbon, 2018 (n=131).

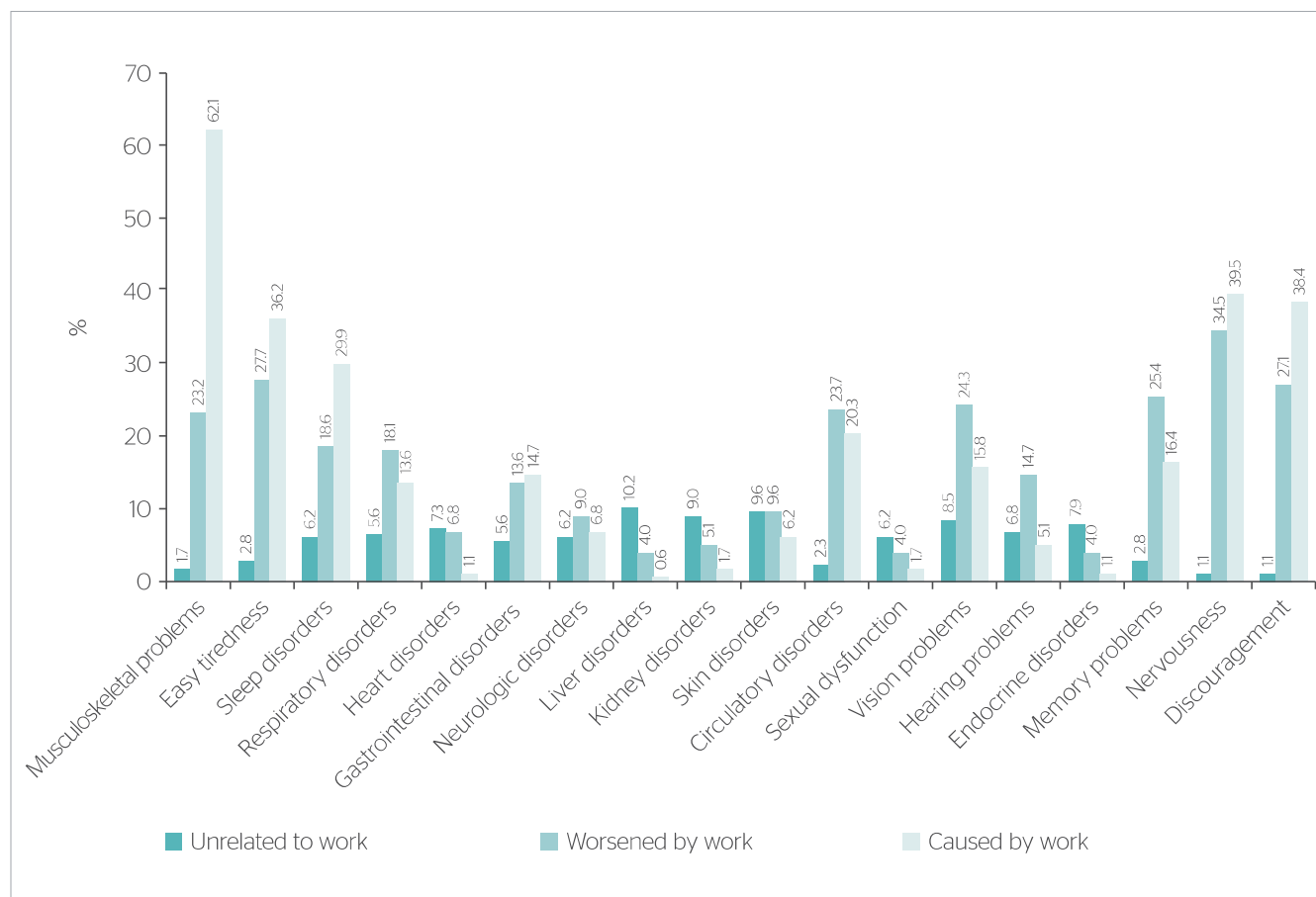
risks within preventive strategies is an absolute priority. Such strategies involve efforts to sensitize employers to the need to comply with the legislation on health and safety at work (HSW), more particularly seeking to identify risk factors, assess risk, interventions to reduce or eliminate them, and information and periodic training on HSW. The results point to the need for more commitment of employers to the health and safety of workers, and to improve the organization and functioning of HSW services. Improvement of management systems through better knowledge of the internal practices of companies is equally necessary.

Perhaps the most relevant results are the ones which reflect the self-perceived exposure to occupational hazards, and consequent risk and work-related health problems, which require immediate attention from HSW services and organizations. In addition, interventions

on HSW should be complemented with more objective and quantified risk assessment, which demands easier access to observation and analysis of the working conditions within their actual context. This is to say, only work analysis from a systemic perspective and by means of appropriate methods and instruments — provided by occupational medicine, HSW, ergonomics and psychology of work — will enable contributions to HSW through changes in the working conditions in the analyzed companies.

## CONCLUSIONS

The results of the present study evidenced considerable variability in working conditions, functioning, relationship between employers and employees and relevance



**Graphic 4.** Perceived origin of health problems, Lisbon, 2018 (n=131).

attributed to HSW between the analyzed companies (and even among different facilities at one and the same company). This diversity demands customized interventions designed based on these very differences and particular contexts to prevent the occurrence of work-related diseases and accidents.

In addition, greater investment in training in HSW — not only targeting employees, who might derive much benefit from such information as concerns the development of health protection and well-being strategies, but also managers<sup>23</sup> — would improve the proficiency and awareness of the various organizational actors, who are the core of the process to stimulate changes in attitudes and behaviors at the analyzed companies.

We should also point out the need to articulate the employees' perspective to ergonomic analysis of workstations (which could not be done due to the refusal of companies to participate in the study) and eventually also of clinical evaluation of the depression and anxiety symptoms reported by the participants.

To summarize, the results confirm that from the participants' perspective, many HSW aspects need to be improved, and thus justify more thorough investigation of the workers' health and safety to develop more adequate strategies for prevention of occupational hazards targeting the investigated population of workers. This presupposes better training (or empowerment) of workers to identify risk factors and the best ways to prevent and interfere with occupational hazards, in addition to stronger supervision from HSW authorities.

## ACKNOWLEDGMENTS

The workers' participation, the Doormen, Guards, Cleaners, Domestic Workers and Other Activities Trade Union collaboration, and funding by the Working Conditions Authority (Autoridade para as Condições do Trabalho — ACT) were crucial for the performance of the present study.

## REFERENCES

1. Conselho de Segurança Privada. Relatórios. Lei nº 34/2013 de 16 de maio. Conselho de Segurança Privada; 2013.
2. Grupo de Trabalho Segurança Privada. Relatório: Despacho nº 11.308/2015, de 30 de setembro de 2015. Grupo de Trabalho Segurança Privada; 2016.
3. Documento Único, Relatório de Atividades e Contas Anuais, Empresa A, B, C e D, 2016.
4. Boletim do Trabalho e Emprego. 2011;78(17):1453-566.
5. Brasil. Lei nº 34/2013. Diário da República. 2013;(94).
6. Wisner A. Understanding problem building: ergonomic work analysis. *Ergonomics*. 1995;38(3):595-605. <https://doi.org/10.1080/00140139508925133>
7. Leiter MP, Zanaletti W, Argentero P. Occupational Risk Perception, Safety Training, and Injury Prevention: Testing a Model in the Italian Printing Industry. *J Occup Health Psychology*. 2009;14(1):1-10. <https://doi.org/10.1037/1076-8998.14.1>
8. Six F. L'ergonome et le chantier. Toulouse: Octarès Éditions; 2016.
9. Portell M, Gil RM, Losilla JM, Vives J. Characterizing Occupational Risk Perception: the Case of Biological, Ergonomic and Organizational Hazards in Spanish Healthcare Workers. *Spanish J Psychology*. 2014;17:E51. <https://doi.org/10.1017/sjp.2014.55>
10. Giurgiu DI, Jeoffrion C, Roland-Lévy C, Grasset B, Dessomme BK, Moret L, et al. Wellbeing and occupational risk perception among health care workers: a multicentre study in Morocco and France. *J Occup Med Toxicology*. 2016;11:20. <https://dx.doi.org/10.1186%2Fs12995-016-0110-0>
11. Ramos S. AGE: Monitorização da Saúde e da Idade no Trabalho. Relatório de Projeto [Internet]. Portugal: ISCTE-IUL/ACT; 2017 [cited 12 Mar 2018]. Available at: [http://www.act.gov.pt/\(pt-PT\)/Publicacoes/ProjetosApoiados/2017/Documents/Manual%20AGE.pdf](http://www.act.gov.pt/(pt-PT)/Publicacoes/ProjetosApoiados/2017/Documents/Manual%20AGE.pdf)
12. Derriennic F, Touranchet A, Volkoff S. Âge, travail, santé. Études sur les salariés âgés de 37 à 52 ans. Enquête ESTEV 1990. Paris: INSERM; 1996.
13. Ehster JM, Marquié JC, Pujol M. VISAT: une étude longitudinale sur la relation vieillissement, santé et astreintes de travail. *Médecine et Travail*. 1995;166:22-9.
14. Molinié AF. Enquête « Santé et Vie professionnelle après 50 ans » Résultats par secteur d'activité. Rapport de Recherche. França: Centre d'Études de L'Emploi; 2005.
15. Molinié AF, Leroyer A. Suivre les évolutions du travail et de la santé: EVREST, un dispositif commun pour des usages diversifiés. *PISTES*. 2011;13(2).
16. Kinsten A, Hanson LM, Hyde M, Oxenstierna G, Westerlund H, Theorell T. SLOSH-Swedish Longitudinal Occupational Survey of Health: A nationally representative psychosocial survey of Swedish working population. Estocolmo: Stress Research Institute; 2007.
17. Duarte C, Ramos S, Cunha L, Lacomblez M. Da organização do trabalho à saúde ocupacional: análise das condições da actividade profissional na indústria têxtil e do vestuário - a especificidade do trabalho feminino. Porto: IDICT; 2002.



18. Eurofound. 5th European Working Conditions Survey: Sustainable work and the ageing workforce. Luxembourg: Publications Office of the European Union; 2012.
19. Tuomi K, Ilmarinen J, Jahkola A, Katajarinne L, Tulkki A. Work ability index. Helsinki: Finnish Institute of Occup Health; 1998.
20. Bakker AB, Demerouti E. Job Demands-Resources theory. In: Cooper C, Chen P, eds. Wellbeing: a complete reference guide. Chichester: Wiley-Blackwell; 2014. p.37-64.
21. Ministère du Travail, des Relations Sociales, de la Famille et de la Solidarité. L'Enquête SUMER. France: Ministère du Travail, des Relations Sociales, de la Famille et de la Solidarité; 2009.
22. DARES. Enquête Conditions de Travail. Ministère du Travail et de l'Emploi: Direction de l'Animation de la Recherche, des Études et des Statistiques (DARES). France: Ministère du Travail et de l'Emploi; 2012.
23. Uva AS, Prista J. Necessidades e expectativas em Saúde e Segurança dos técnicos e restantes trabalhadores da saúde. J Ciênc Méd. 2004;168(1):25-4.

---

Correspondence address: Sara Ramos - Instituto Universitário de Lisboa, cacifo 010AA - Avenida das Forças Armadas - CEP: 1649-026 - Lisbon, Portugal - E-mail: sara.ramos@iscte-iul.pt