Occupational stress and cardiovascular issues in television news activity

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Abstract. This paper represents a sequence of an extensive study aiming to highlight occupational risks and workloads / overloads and their impact on employees' physical and mental health, and safety in the departments of a national TV company. This paper specifically deals with the News department. The study used an ergonomic methodology including technical-organizational and psychophysiological analysis of activities and conditions for their accomplishment, evaluation of work-related effort, assessment of work-related stress, morbidity peaks. The News department activity is characterized by working in shifts including night shifts, working on weekends and holidays, working long hours, field work, high standards of work, limited control, time pressure. The total work-related effort was of increased values, especially through very high mental effort and high temporal effort. The stress coefficients obtained in the news lot were the highest of all other lots from the other departments. The cardiovascular disorders were in the highest percentage in this lot. Metabolic and nutrition disorders were in significant numbers, too. Although activity, conditions, psychosocial environment components with probable impact on cardiovascular health might seem similar in several departments, the News' one distinguished by the highest cardiovascular diseases percentage. In the crucible of multifactorial probable and possible cardiac disorder causal vectors, occupational stress distinguishes and might be correlated with the cardiovascular situation in the News department. It looks like closer "behind the glass" translates as prone to a greater stress and presumably to a higher cardiovascular risk.

1 Introduction

The broadcasting industry deals with the exposure to specific risks factors and workloads, and sometimes overloads, in the professional activity such as psychosocial risk factors and occupational stress, working in shifts (including night shifts), working long hours, field work, and their significant impact on worker's physical and mental health.

The workers' mental health and wellbeing at work can be significantly altered in Film and TV industry. An UK based study has shown that people working in Film and TV industry

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face greater psychosocial risk factors or occupational stress than those working in other industries. Moreover, among the reported mental health problems were depression (64%), panic attacks (47%), other anxiety disorders (28%); 55% of workers have considered suicide and 10% had attempted to end their life. All of these are significantly higher percentages than those in the general population in UK [1]. While an updated UK survey for the Film and TV industry shows a decreasing trend in some of these percentages, they remain significantly higher than in the general population [2]. Such a detailed report for the TV industry in Romania is not available and mental health issues are much less reported presumably because of an associated stigma to mental illnesses [3].

The intense pressures of the activity, such as strict deadlines, erratic schedules, and the emotional toll of reporting on difficult topics can make the already fast-paced TV news environment even more likely to cause anxiety and burnout, potentially harming people's health, as research suggests [4].

Our paper represents a sequence of an extensive ergonomic study that aimed to identify occupational risks, workloads and eventually overloads and their impact on employees' health, safety and wellbeing at work in the departments of a national TV company. This paper specifically deals with the News department and looks at the workers' cardiovascular and metabolic disorders and the occupational settings in which they develop.

New job requirements and challenges of the technological evolution in face of market competition caused in the studied television company an imbalance between the market-imposed standards and the workers' capacity resulting in occupational overloads and employees' health issues as the cost.

Our paper aims to highlight the TV news workers' occupational stress and consider it an important contributor to their cardiovascular issues.

In accordance with the current "European Guidelines on cardiovascular disease prevention in clinical practice" there is a dose-response relationship between psychosocial stress and the occurrence and evolution of cardiovascular disease independent of gender and conventional risk factors [5]. Psychosocial stress has been related to the risk of coronary heart disease (CHD) events – both fatal and non-fatal – in both men and women. Furthermore, there has been a causal dose-response relationship in both genders and the CHD risk has been higher (almost doubled) with recurrent high psychosocial stress. Thus, psychosocial stress can be regarded as a fundamental cause of cardiovascular morbidity and mortality [6].

Work-related stress can be correlated with lower odds of having favourable cardiovascular health and in fact may be an upstream risk factor for unfavourable cardiovascular health. Moreover, it seems this effect is even greater if stress is present for some time [7]. Exposure to either job strain or effort-reward imbalance can be associated with an adjusted 49% CHD risk increase, whereas combined exposure can be associated with an adjusted CHD risk increase as high as 103% [8].

The effects on cardiovascular health of working in shifts, night shift, working long hours, other components of the work regime for the studied TV company' employees, potentially add or intertwine with the effects of occupational stress. Previous work showed that the pattern of working in shifts is associated in a dose-response manner with cardiovascular events' risk after five years of exposure. With each year of shift work after the first initial five years, there was a 7.1% increase in risk of cardiovascular disease events. The risk of coronary heart disease morbidity among shift workers was 26% higher than in day workers and an almost 20% higher risk of cardiovascular disease and coronary heart disease mortality was noticed in shift workers [9]. On the other hand, especially working permanent night shifts and frequent night shifts was associated with an increased risk of incident ischemic heart disease [10]. In addition, being exposed to long working hours for more than 10 years was significantly associated with ischemic heart disease, the association being stronger among men than women [11].

2 Methodology

The methodology of the study was an ergonomic one in a multifactorial, multidimensional and multidisciplinary approach of the specific occupational risks, activities, workloads and potentially overloads. This includes the analysis of professional activities in relation to all characteristic aspects (technical, organizational, psychophysiological, ergonomic, environmental), identification of occupational risk factors and workloads /overloads and their effect on workers' mental and physical health.

The study used specific ergonomic methods like: discontinuous observation, images of the work day, technical and medical documents analysis, check-lists, interviews, questionnaires.

This ergonomic research design is important because it can provide a holistic view of work-related stress, accommodating the complex interplay of qualitative and quantitative factors. Past research into occupational stress has generally shown that relying only on quantitative measures can hide important contextual details. Meanwhile, qualitative studies, by themselves, may lack broad applicability [4]. By combining quantitative data on workload, psychosocial factors, and emotional responses with qualitative narratives detailing individual experiences, our study addresses some acknowledged gaps in existing literature regarding the psychological demands on employees working in TV news. This integrative approach aligns with contemporary research trends favouring comprehensive assessments of psychological well-being, and also ensures the research findings are applicable and relevant to industry stakeholders wanting to implement effective interventions [12, 13]. In undertaking this research design, our study hopes to generate insights that can inform organizational practices and policies in the television news sector and contribute to discussions about occupational health and stress management.

In this OSH (occupational safety and health) case study, the studied group included 79 participants almost equally distributed on gender criteria (49.37% women) and the average age of the group was 49.94 years.

The occupational effort of the study's participants was assessed through NASA-TLX and the psychosocial factors and occupational stress were evaluated through questionnaires like the Romanian Questionnaire for Work Stress Assessment and Romanian Version of the Copenhagen Psychosocial Questionnaire (COPSOQ) [14]. The Romanian Questionnaire for Work Stress Assessment (RQWSA) contains several scales about professional demands concerning: the type of activity and work tasks, work organization and task content, individual-work interface, employees' health and stress, somatically, cognitively and behaviourally, and scales for working environments and job satisfaction.

3 Results

3.1 Activity

In the News department, the activity is a complex one, with high degree of responsibility. It implies the participation and collaboration of an important number of persons / functions, each function representing specific tasks in order to accomplish the final objective.

Journalists, TV producers, cameramen, image directors, image editors, production operators, documentarians work closely together to create the most relevant images for describing or understanding an event or a news program through live or recorded broadcasts, by finding the most appropriate specific technical and artistic means, at the imposed standards, putting them in relation to the public's interest.

The activity is carried out indoors and outdoors. Indoor activity has risks specific to working at video terminals. Indoors, have been noticed certain ergonomic deficiencies regarding the work spaces, workstations, work furniture, and the environmental conditions of the activity (lighting and microclimate deficiencies). Outdoors, the personnel were subject to specific risks depending on the situation broadcasted (sometimes war, fire, flood etc.) and the environmental conditions. Part of the staff (cameramen, journalists) is subject to the sum of indoor and outdoor activity risks.

Producing complex television news broadcasts and programs involves finding subjects, documenting, participating in filming and editing assuring the accuracy and objectivity of the information transmitted, conducting interviews in the studio or on the field, presenting news shows, selecting images and sound, coordinating current graphics, framing graphics and images in the newsroom settings, and selecting live broadcast.

Overall, the activity is predominantly mental involving: creativity, organizational and planning skills, the ability to make quick decisions, sometimes difficult ones, to have spirit of initiative when the situation requires it, the ability to communicate and work with different types of people and, last but not least, involving manual dexterity (through cognitive and psychomotor skills). High standards of quality and efficiency of work at a high working pace, team work and availability to work overtime are characteristics of this job.

All of these demands are placed within the framework of shift work including permanent night shifts (24 hours a day, 7 days a week), long hours' work (due to high volume of work, emergencies in life or recorded broadcast and insufficient number of staff), weekend and holiday work, and field work.

Imbalance between professional life and family life was sometimes encountered.

The activity mainly involved neuropsychic overload.

3.2 Psychosocial factors and occupational stress

From the investigations carried out, it can be concluded that in the News group there are neuropsychic stress factors of medium level in most routine situations and increased or very increased in the case of peak mobilization carried out in more special conditions, of increased difficulty and responsibility. However, the situations requiring peak mobilisation were quite frequent.

According to the results of RQWSA, the following neuropsychic stress factors have prevailed:

- the difficulty of certain work tasks and operations, due to both the high degree of complexity and the consequences involved in carrying them out;
- high volume of activity determined by the multitude of tasks to be performed;
- the work pace represented in certain situations a stress factor and was not being perceived as free, but imposed, with moments of overload;
- time constraints were an important stress factor;
- increased responsibility in relation to the results of the activity;
- different types of professional conduct involved in performing the task (regulated or creative work operations based on mental processing and conscious choice of alternatives);
- the professional demands due to the nature and characteristics of the work task, the conditions of its performance, the work equipment, were predominantly mental. Among the mental demands cognitive ones stood out: working memory, short-term and long-term memory, attention focused on task performance and special vigilance, thought processes such as the ability to analyse and synthesize, problem solving, algorithmic and especially heuristic thinking, both divergent and convergent cognitive processes, analogical, inductive and deductive logical approaches, the combination of cognitive and volitional processes such as the ability to make quick decisions based on both the experience-intuition binomial and the

information-reasoning binomial, executive and strategic decisions, programmed and unprogrammed (in unforeseen situations) decisions.

Based on the subjective evaluation indicators of NASA-TLX, it was possible to highlight the increased perceived level of total professional effort. Among the different types of professional demands that contribute to total professional effort, the highest level of mental demands distinguished, followed in a decreasing order by temporal demands.

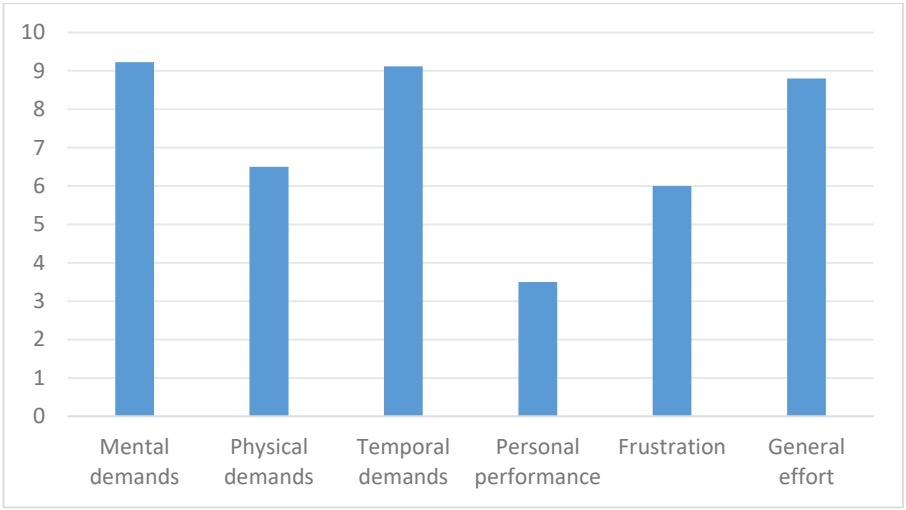

Fig. 1. Work effort and work demands levels (NASA-TLX)

The results recorded by applying the Romanian version of COPSOQ signalled psychosocial risk factors derived from the nature and content of the work task, the organization of the activity and the conditions for its performance, as well as from interactions in the psychosocial environment (among colleagues, between superiors and subordinates, between people from different departments, etc.). The following were primarily signalled: temporal (quantitative) demands of the activity (working under time pressure), cognitive demands, sensory-perceptive demands of the activity (visual, auditory) and responsibilities.

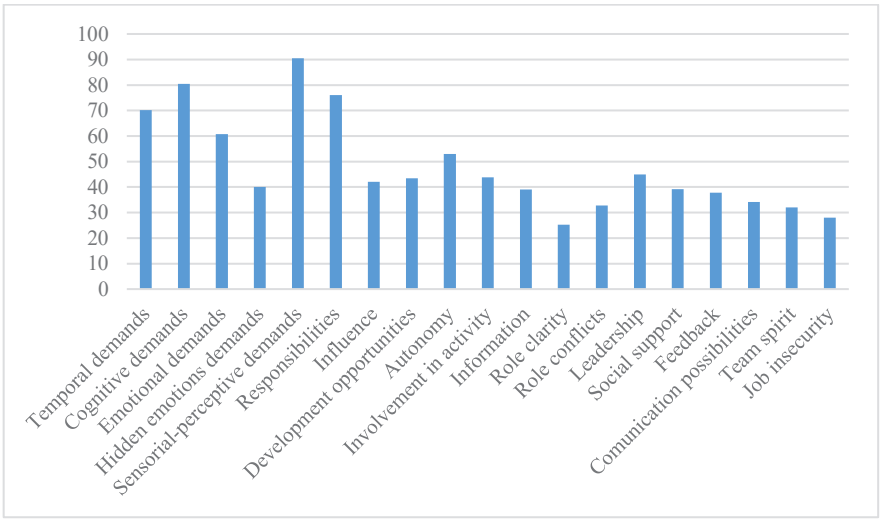

Fig. 2. Levels of mental demands and psychosocial risk factors (COPSOQ)

The identified occupational stress in the News group corresponds to the job strain theoretical model.

3.3 Metabolic and cardiovascular health

In the News group, the cardiovascular disorders were in the highest percentage of all studied groups from other departments, 29.11%.

They mainly consisted in hypertension (17.72%), treated in most cases, but also hypertensive hypertrophic cardiomyopathy, cardiac rhythm disorders, valvulopathies and congestive heart failure were found. Overall, the cardiovascular disorders were distributed more in women than men in the news' group, being almost double in women. In women, the most represented age groups for cardiovascular pathology were 40-45 and 46-55 years old, double than in the 56-63 age group. In men, the most represented age group was 56-65 years old, followed in a decreasing order by 46-55 and 40-45 age groups. In most of the cases, the cardiovascular pathology was found in participants with at least 10 years of seniority.

In addition to the cardiovascular disorders, changes in 12.66% of the basic (resting) ECGs have been noted. These included inversion of the T wave in relation to the QRS complexes mostly in V_1-V_3, ST segment deflections (elevations and depressions) at least 1 mm from the baseline and left ventricular / atrial hypertrophy. ST elevations can be attributed to several conditions apart from acute myocardial infarction, including to the left ventricular hypertrophy. ST depressions can also be attributed to different conditions and often to myocardial ischemia. The T wave, ST segment changes in the basic ECGs were equally distributed between men and women. The basic ECG changes require further cardiological investigation. Hence, it is possible that the actual number of cardiovascular disorders in the News group is even higher.

The nutrition and metabolic disorders in the News group represented 13.92%. They mainly consisted in dyslipidemia and obesity, but also in type II diabetes mellitus. Although in significant numbers, the nutrition and metabolic disorders in the News group are less represented than in other groups from the studied TV company. Possible explanations could be a less static work and much more concern about how they look especially for those who appear on the glass.

By comparison, in the broadcast technical branch' (that is technically ensuring and supervising the broadcasting of all TV channels with switching to live transmission) group, the percentages of the nutrition and metabolic diseases were much higher: 26.19% of obesity, 16.67% of dyslipidemia, 4.76% of type II diabetes mellitus. The percentage of cardiovascular disorders in the technical branch' group was few percentages lower than in the News one, 26.19%, and in probable relationship with its' more prevalent metabolic syndrome. The hypertension was found in similar percentages in both groups, close to 18% [15]. However, in the News group, the relationship between occupational stress and hypertension seems to be more important. Moreover, the News group had notably more changes in their basic ECGs. In addition, the predominance of cardiovascular pathology in women and in greater percentages in the 40-45 and 46-55 age groups than in men would also plead for a link with occupational stress who is both of high value and might affect them more.

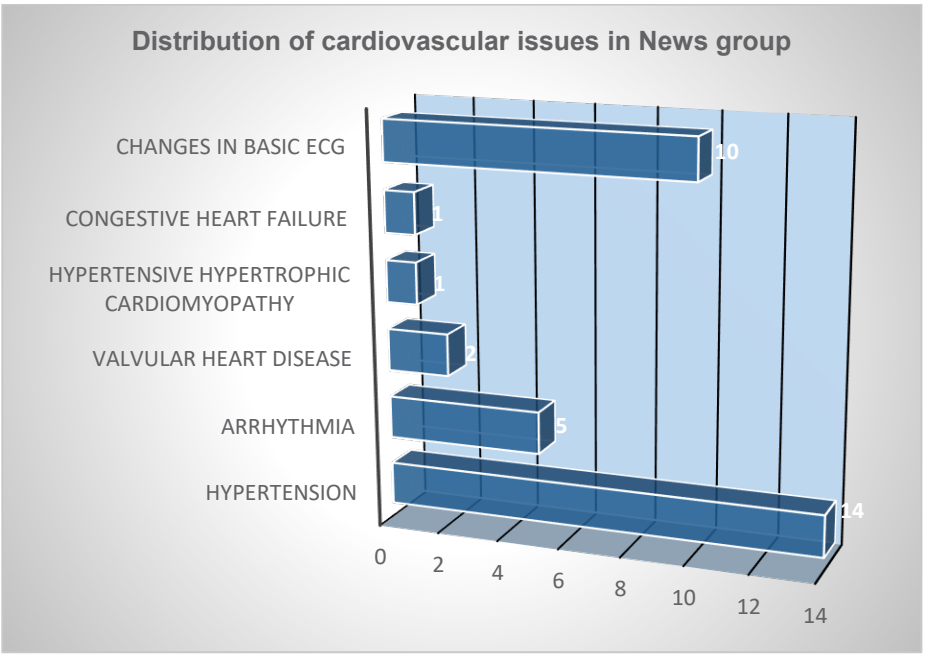

Fig. 3. Cardiovascular disorders and basic ECG changes in the News group

4 Discussions

The cardiovascular issues found in News group appear and develop in a complex matrix formed by individual and work-related risk factors (derived from the nature, content and conditions of the activity, the work environment, etc.), workloads and overloads.

First of all, they appear in the context of a country with very high cardiovascular risk. Then, the mean age of participants is close to 50 years and age is a major independent cardiovascular risk factor [5].

The work pattern of shift work including permanent night shifts and long hours' work is in a probable relationship with cardiovascular disease [9, 10, 11].

Unexpectedly, women had more cardiovascular pathology then men, including in the 40-45 age group. However, the findings of our study were limited by the rather small number of participants.

The general context of the country, the mean age of the participants >45 years, working in shifts including permanent night shifts and long hours' work are a common denominator in several studied groups from the TV company with > 25% of cardiovascular disorders [15]. However, the News group distinguished by both the most significant occupational stress and the highest percentage of cardiovascular disorders. Although the study doesn't offer proof of causality, based on previous research on the relationship between occupational stress and cardiovascular disorder [5, 6, 7, 8] and our results, it can be assumed that occupational stress in the News group is an important culprit in the crucible of multifactorial probable / possible causal vectors for cardiovascular disease.

In addition, the increased occupational stress in the News group may be, at least in part, explained by the many functions that compose TV news activity with a possible cumulative effect of stress factors.

Another assumption would be there's not much research specifically looking at what causes stress in this unique workplace. This points to a gap in what we know about job-related health.

Given the growing awareness of workplace mental health, this research can be important for this specialized field. Academically, this study will add to the literature on occupational health, specifically within high-pressure environments; practically, it should offer insights for organizational policies that better support the mental health of TV industry employees. Ultimately, understanding work-related stress in the TV news sector is crucial for building a healthier, more resilient workforce and maintaining the integrity of journalism and the public's trust [12]. Consequently, as media professionals grapple with modern news coverage, this research as well as other studies in the field are vital for addressing work-related stress and finding proactive solutions [13].

5 Conclusions

Our research addresses to a gap in what we know about work-related health, and specifically the impact of occupational stress on the cardiovascular issues in the settings of TV news activity.

Both the most significant occupational stress and the highest percentage of cardiovascular disorders were found in the News group. This is an indication that among the multifactorial probable / possible causal vectors for cardiovascular disease, occupational stress is an important one in the News group. This research direction would be worth addressing in a causality study.

Another important insight of this study is that, although the study participants were equally divided between men and women, beginning with 40 years old, women were affected in almost double the number of men in terms of cardiovascular disease.

Among appropriate measures, stress coping strategies are important ones that should be taken in order to ensure health, safety and wellbeing in this high-pressure work environment.

References

1. M.Wilkes, H.Carey, and R. Florisson, The Looking Glass. Mental Health in the UK film, TV and cinema industry, Lancaster University, 14-15 (2020)
2. Looking Glass Report. Mental Health in film, TV and cinema, Film and TV Charity Survey, 9-11 (2024)
3. E. A. Manescu, C. Henderson, C. R. Paroiu, and A. Mihai, Mental health related stigma in Romania: systematic review and narrative synthesis, BMC Psychiatry, **23**, 662 (2023) https://doi.org/10.1186/s12888-023-05147-3
4. Y.K. Dwivedi, L. Hughes, A.M. Baabdullah, S. Ribeiro-Navarrete, M. Giannakis, M.M. Al-Debei, D. Dennehy, B. Metri, D. Buhalis, C. M.K. Cheung, K. Conboy, R. Doyle, R. Dubey, V. Dutot, R. Felix, D.P. Goyal, A. Gustafsson, et al., Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy, International Journal of Information Management, **66**, 102542-102542 (2022) https://doi.org/10.1016/j.ijinfomgt.2022.102542
5. F. L. J. Visseren, F. Mach, Y. M. Smulders, D. Carballo, K. C. Koskinas, M. Bäck, A. Benetos, A. Biffi, J.-M. Boavida, D. Capodanno, B. Cosyns, C. Crawford, C. H. Davos, I. Desormais, E. Di Angelantonio, O. H. Franco, S. Halvorsen, F. D. R. Hobbs, M. Hollander, E. A. Jankowska, M. Michal, S. Sacco, N. Sattar, L. Tokgozoglu, S. Tonstad, K.P. Tsioufis, I. van Dis, I.C. van Gelder, C. Wanner, B. Williams, ESC Scientific Document Group, 2021 ESC Guidelines on cardiovascular disease prevention in clinical practice: Developed by the Task Force for cardiovascular disease prevention in clinical

practice with representatives of the European Society of Cardiology and 12 medical societies With the special contribution of the European Association of Preventive Cardiology (EAPC), Eur Heart J, **42**, 3227–3337 (2021)
https://doi.org/10.1093/eurheartj/ehab484

6. B. Kubera, T. Kohlmann, and A. Peters, Psychological stress, body shape and cardiovascular events: Results from the Whitehall II study, Compr Psychoneuroendocrinol., **9**, 35211687 (2022)
https://doi.org/10. 1016/j.cpnec.2021.100104
7. O. Ogunmoroti, O. Osibogun, N.B. Allen, V. Okunrintemi, Y. Commodore-Mensah, A.J. Shah, and E.D. Michos, Work-Related Stress Is Associated with Unfavorable Cardiovascular Health: The Multi-Ethnic Study of Atherosclerosis, J. Am Heart Assoc., **22**, e035824 (2024)
https://doi.org/10.1161/JAHA.124.035824
8. M. Lavigne-Robichaud, X. Trudel, D. Talbot, A. Milot, M. Gilbert-Ouimet, M. Vézina, D. Laurin, C.E. Dionne, N. Pearce, G.R. Dagenais, and C. Brisson, Psychosocial Stressors at Work and Coronary Heart Disease Risk in Men and Women: 18-Year Prospective Cohort Study of Combined Exposures, Circ Cardiovasc Qual Outcomes, **16**, e009700 (2023)
https://doi.org/10.1161/CIRCOUTCOMES.122.009700
9. L. Torquati, G.I. Mielke, W.J. Brown, and T. Kolbe-Alexander, Shift work and the risk of cardiovascular disease. A systematic review and meta-analysis including dose-response relationship, Scand J Work Environ Health, **44**, 229-238 (2018)
https://doi.org/10.5271/sjweh.3700
10. M. Kader, J. Selander, T. Andersson, M. Albin, T. Bodin, M. Härmä, P. Ljungman, and C. Bigert, Night and shift work characteristics and incident ischemic heart disease and atrial fibrillation among healthcare employees - a prospective cohort study, Scand J Work Environ Health, **48**, 520-529 (2022)
https://doi.org/10.5271/sjweh.4045
11. M. Fadel, J. Li, G. Sembajwe, D. Gagliardi, F. Pico, A. Ozguler, B.A. Evanoff, M. Baer, A. Tsutsumi, S. Iavicoli, A. Leclerc, Y. Roquelaure, J. Siegrist, and A. Descatha, Cumulative Exposure to Long Working Hours and Occurrence of Ischemic Heart Disease: Evidence from the CONSTANCES Cohort at Inception, J. Am Heart Assoc., **9**, e015753 (2020)
https://doi.org/10.1161/JAHA.119.015753
12. Raisch S. and Krakowski S., Artificial Intelligence and Management: The Automation–Augmentation Paradox, Academy of Management Review, **46**, 192-210 (2021)
https://doi.org/10.5465/amr.2018.0072
13. J. Akkermans, J. Richardson, M.L. Kraimer, The Covid-19 crisis as a career shock: Implications for careers and vocational behavior, Journal of Vocational Behavior, **119**, 103434 (2020)
https://doi.org/10.1016/j.jvb.2020.103434
14. R. Iordache and V. Petreanu, The Romanian Version of the Copenhagen Psychosocial Questionnaire – Short Report, Procedia - Social and Behavioral Sciences, **149**, 424-427 (2014)
https://doi.org/10.1016/j.sbspro.2014.08.201

15. D. Mihaila, R. Iodache, V. Petreanu, and C. Busneag, Occupational Stress and Health in Broadcasting Activity. An Introspective Ergonomic Analysis, Proceedings of the 22nd Congress of the International Ergonomics Association, Jeju, South Korea, August 25-29 (2024), **3**, (Springer - to be published in 2025)