

EXPOSING WOMEN TO WORKPLACE STRESS FACTORS AS A RISK FACTOR FOR DEVELOPING ARTERIAL HYPERTENSION

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Abstract: The purpose of this study is the evaluation of women's exposure to stress-inducing factors at work, definition of a scale of the problem, as well as assessment of the impact of professional work on the value of arterial pressure. The research was conducted on four professional groups of women: working in agriculture, working as clerks, seamstresses, as well as those working as medical representative in the period from August–September 2008 in the Lublin region. A total number of 416 women was examined, ages ranging from 30–40, who had not been previously treated due to arterial hypertension. The women under examination had their arterial blood pressure measured twice on a working day at 08:00 and at 14:00. The values of measurements were averaged. The research tool was also the standardised Questionnaire for Subjective Work Evaluation. The raw result was obtained on the basis of summing up all the points, which were afterwards transformed into 10 standard values. The general result was given in 10 standard values, whereas the results of stress factors were quoted as mean results of raw values and were referred to results defined as high for a given factor. The results obtained were statistically analysed on the basis of t-Student test. The significance level adopted was $p < 0.05$. The results obtained in a particular professional group were compared as well as the impact of socio-demographic variables, such as level of education, marital status, place of residence, on the intensification of stress related to a particular factor of work evaluation, was also analysed. Stress experienced by women at a workplace affects not only their professional life, but also family life and social intercourses. In the women's opinion, an unpleasant workplace is such a workplace where the feeling of mental workload is connected with the lack of rewards (motivation), uncertainty resulting from organisation of daily chores and lack of support from others. The high general level of stress was noted among the group of women working in agriculture, in pharmaceutical companies, as well as among those who perform physical work (seamstresses). The intensification of stress at a workplace had a considerable impact on the value of arterial pressure among the group of woman medical representatives, as well as among the group of woman office workers. No significant dependencies were concluded between socio-demographic variables and the general level of exposure to intensified stress in the examined professional groups. The above research confirms the need for further examination of the working environment of women and its impact on health. Obviously, attempts should be made in order to improve the conditions of work for women, bearing in mind the fact that the adoption of neutral attitude towards the sexes when assessing risk and undertaking preventive activities may result in the female gender being underestimated or even disregarded.

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INTRODUCTION

Developed European communities currently demonstrate bigger needs associated with safety and health protection of the employed as well as with the improvement

of quality of their life. These problems became the priority directions of scientific research strategy. The need for research in the field of identification of threats and mitigation of risk resulting from the application of new technologies at a workplace was described in the reports published,

among others, by the Institute for Prospective Technological Studies in Seville [13] and the Economical and Social Committee of the European Union (ECOSOC) [27]. The results of the research conducted by the European Agency for Safety and Health at Work show that 28% out of 160 million people employed in the European Union are exposed to stress resulting from work performed [17]. The directions of work in the field of safety and health at work, necessary to be undertaken in the European Union in the nearest future, were analysed by the European Foundation for the Improvement of Living and Working Conditions in Dublin. [4] Priority needs of the activities in the field of safety and protection of the employed are presented in the report of the European Agency for Safety and Health at Work [15] prepared on the basis of data collected from the member states. The European Union mentions the following tasks as the areas of the highest priority: 1) reasons and ways of risk mitigation associated with psycho-social factors causing stress, 2) ergonomic risk factors, 3) threats resulting from exposure to chemical substances, 4) risk of injuries and accidents resulting from non-fulfilment of safety requirements governing machines, systems and industrial installations, 5) occupational diseases, 6) threats connected with physical factors.

In the members states of the European Union, as the fundamental directions of systematic tasks aiming at the mitigation of threats, the method of occupational risk assessment was developed as well as of safety management and health at work and the development of “clean” and safe technologies. The European Union guidelines regarding prevention and overcoming stress at the workplace specify 4 platforms: employee, employer, State and European Union. In order to effectively work within each of those platforms, it is necessary to be aware of the costs which the stress burden at the workplace triggers. Stress at the workplace makes the quality deteriorate considerably as well as lowering work efficiency. Research shows that 50-60% of employee sick leave absenteeism is a result of stress at the workplace. The cost of doctor’s leave certificates issued to employees and the cost of their treatment in the European Union is estimated at about 20 million euro. It is assessed that 16% of cardiac and vascular diseases is a consequence of stress at workplace. On the other hand, the consequences of a mental nature are enumerated as follows: feeling of acute fatigue, condition of psychic tension, depression, disturbances of concentration, disturbances of sleep and even mental diseases [17]. Therefore, it is understandable that the prophylactics against stress occurrence at the workplace on the organisational and individual level constitute the preferred form of activity, both by the regional and international organisations. In Poland, the Polish Labour Inspection has been implementing for several years, a programme under the title “Counteracting negative effects of mental burden and stress at work” [31, 41].

There is a notion of hypertension connected with stress. Nevertheless, the research into the factors causing arterial

hypertension development produce controversial results. The tests made on animal models have already proved that the exposure to stress may be one of the factors causing arterial hypertension among individuals who are more vulnerable to its development. Japanese studies show that exposure to stress at the workplace contributed to the hypertension occurrence as a result of the lengthening of working time and reducing leisure time [25]. Another study showed that in different groups of employees the combination of an employer’s high requirements and the lower level of control over the task performance is the most burdensome and contributes to the development of hypertension [38]. Several studies show that the intensification of pressure reaction on mental stress may be helpful when selecting in persons threatened with the future development of arterial hypertension [9, 30, 33]. On the basis of the reaction level of the cardiac and vascular system in the population, it is possible to determine a constant type of response for a given person, weak or reinforced, which relates to the development of arterial hypertension. The CARDIA (Coronary Artery Risk Development in Young Adults) programme defined the pattern of behaviour called “impatient” (TUI – time urgency/impatience), characterised by the lack of patience, the feeling of lack of time, and the necessity of constant rush which is associated with a twofold higher risk of arterial hypertension development [2].

Due to the existence of distinctive division on the labour market in the European Union into the professions dominated by women and those dominated by men, the employees of each sex have different work environments. Sex inequality, both at the workplace as well as outside it, influences also the safety and protection of women’s health at workplace. There is an important dependence between the wider discrimination problem and health protection. Women still perform most of the unpaid household jobs and take care of children, even if they also do paid full-time job. This causes a considerable lengthening of women’s effective working time and exerts an additional pressure on them if there is a conflict between professional duties and family life [1, 16]. Despite the fact that the high vulnerability to stress resulting from work performance refers to both sexes, women are those who are exposed to women-related stress factors at work, such as, sexual harassment or discrimination. Work causing emotional burden and the double workload with a paid job and home duties causes a negative impact on both the physical and mental condition of working women [16].

The research conducted in 10 member states of the European Union shows that the discomfort caused by stress occurs more often among women than men. As the study shows, a large group of women in stress situations apply self-stress coping strategies concentrated on emotions, whereas men more often apply style based upon problem solving. This causes a bigger burden and more serious consequences of stress at work for women [24].

Stress at work is most often defined as a reaction to stimuli arising in different situations connected with work

[34], or as an adverse employee's reaction to excessive pressure or other requirements imposed by the employer [35]. Analysing and summing up the literature of the subject matter, stress at work may be defined as the discrepancy experienced by a person between the requirements of working environment and his/her capabilities, which is accompanied by various physical, mental and behavioural symptoms.

The purpose of this study is the evaluation of women's exposure to stress-inducing factors at work, definition of the scale of the problem, as well as the assessment of the impact of professional work on the value of arterial pressure.

MATERIAL AND METHODS

The research was conducted on four selected professional groups of women: working in agriculture (146 women), working as clerks (102 women), seamstresses (102 women), as well as those working as medical representative (68 women), in the period from August – September 2008 in the Lublin region. 500 women were invited to join the study. A total number of 416 women was examined, ages ranging from 30–40, who had not been previously treated due to arterial hypertension. The research was randomised and of an individual nature. The women under examination had their arterial blood pressure measured twice on a working day at 08:00 and at 14:00. The values of measurements (systolic and diastolic) were averaged. The research tool was also the standardised Questionnaire for Subjective Work Evaluation. This questionnaire is used for the evaluation of subjective work perception and is designed for the measurement of the individual feeling of employee's stress at work. It makes possible the overall assessment of stress feeling at work, as well as the evaluation of work factors which are particularly stressful for the examined. It consists of 55 statements describing different features of work,

which are assigned with numbers from 1–5 evaluating to what extent a particular feature is burdensome and stressful for the person being evaluated. The following work-related stress factors have been singled out on the basis of the factor analysis: feeling of mental workload, lack of rewards, feeling of uncertainty resulting from organisation, social contacts, exposure to threats, physical discomfort, unpleasant conditions, lack of control, lack of support, feeling of responsibility. The raw result was obtained on the basis of summing up all the points, which were afterwards transformed into 10 standard values. The general result was given in 10 standard values, whereas results of stress factors were quoted as mean results of raw values and were referred to as results defined as high for a given factor. The results obtained were statistically analysed on the basis of t-Student test. The significance level adopted was $p < 0.05$. The results obtained in a particular professional group were compared as well as the impact of socio-demographic variables, such as level of education, marital status, place of residence, on the intensification of stress related to a particular factor of work evaluation, was analysed.

RESULTS

Within the group of women under examination, the values of arterial pressure exceeding the norm (above 140/90 mmHg) were reported, within 6% of woman farmers, 5.2% of woman medical representatives, 5.4% seamstresses and 6.7% of woman clerks.

Mean arterial pressure was the highest within the group of woman medical representatives (134.5/85 mmHg), the values approaching the upper limit of the norm were also observed within the group of women performing office work (130.5/81 mmHg). Women working in their farm households had the mean value of arterial pressure 129/77 mmHg. The lowest mean value of arterial pressure was noted among the seamstresses.

Table 1. Values of arterial pressure among women under examination.

Measurement by RR (mmHg)	Female farmers (I)		Female medical representatives (II)		Seamstresses (III)		Female clerks (IV)	
Measurement by RR (mmHg) apparatus at 08.00								
1 Measurement	systolic	diastolic	systolic	diastolic	systolic	diastolic	systolic	diastolic
Min RR (mmHg)	110	65	115	65	105	60	105	65
Max RR (mmHg)	155	100	150	100	150	95	150	95
Mean RR (mmHg)	128	78	134	84	128	76	130	80
Measurement by RR (mmHg) apparatus at 14:00								
2 Measurement	systolic	diastolic	systolic	diastolic	systolic	diastolic	systolic	diastolic
Min RR (mmHg)	105	65	120	70	105	60	110	65
Max RR (mmHg)	155	95	155	100	145	95	150	100
Mean RR (mmHg)	130	76	135	86	128	78	131	82
Mean RR (mmHg) (8.00 and 14.00)	129.2	77	134.5	85.4	128	77	130.5	81

I–II $p < 0.05$; I–III $p < 0.05$; III–IV $p < 0.05$; I–III NS; II–IV NS; I–IV NS

Table 2. Aggravating impact of a particular stress factor within the groups under examination with reference to high results limit.

Factors	Limit of high results	Female farmers (I)	Female medical representatives (II)	Seamstresses (III)	Female clerks (IV)
Feeling of mental burden	17	24.26	23.76	18.70	19.01
Lack of rewards	14	22.13	19.00	18.47	17.45
Feeling of uncertainty caused by organisation	15	16.14	18.13	19.45	15.05
Social contacts	9	11.32	12.86	8.56	7.54
Feeling of insecurity	10	11.62	11.38	6.66	7.98
Physical discomfort	8	2.65	1.20	2.49	1.88
Unpleasant conditions	5	2.69	1.24	1.41	1.44
Lack of control	8	7.15	6.90	8.27	7.78
Lack of support	5	8.24	5.19	4.94	4.98
Feeling of responsibility	8	10.00	8.82	7.50	8.01

The statistically significant difference of mean values from RR apparatus between woman farmers, woman medical representatives and seamstresses as well as between seamstresses and woman clerks was reported ($p < 0.05$).

Statistically significant differences have been not reported between the measurement by RR apparatus at 08:00 and at 14:00 within the professional groups under examination ($p < 0.05$).

On the basis of the examination it was disclosed that the general feeling of stress at work among the examined women is on a high level (woman farmers, woman medical representatives, seamstresses) as well as on average level among women working as clerks. Statistically significant differences ($p < 0.001$) of the intensification of general stress at work between different professional woman groups were reported. Only among the group of woman clerks and women working as seamstresses the level of intensification of general stress at work is similar. The highest average intensification values were reported among the group of women working in agriculture (8.2); high values were also reported among the group of woman medical representatives (7.8), and slightly lower among the group of seamstresses (6.9). Women performing clerical work have the result of stress intensification feeling within the limits of mean values (6.4).

It was assessed which of the factors at work is putting a particular strain on a given professional group of women under examination.

Among the group of woman farmers the results exceeding the limit of high results were reported in 8 group factors. The biggest burden which had the most significant importance for the group of women farmers under examination was workload, lack of reward, as well as the feeling of uncertainty caused by organisation. The factors, such as: physical discomfort, unpleasant working conditions and lack of control are insignificant.

Women working as medical representatives had results exceeding the limit of high results in 7 group factors. The biggest burden which had the most significant importance

was for them the feeling of workload. The factors such as: physical discomfort and unpleasant working conditions are without significance.

Among the group of women who do physical work as seamstresses the results exceeding the high values were reported in 4 factor groups. As causing the biggest mental burden, the examined women mentioned factors such as feeling of uncertainty at workplace caused by organisation, as well as lack of rewards. However, the examined women attach minor significance to physical discomfort and unpleasant working conditions.

The results for women performing clerical work exceed the limit of high values for factors from 2 groups: the feeling of mental burden and lack of rewards at work.

The next stage of analysis was comparison of the burden caused by a particular factor among the groups under examination.

Comparing the burden caused by stress-inducing factors present at work among women working in agriculture and seamstresses, it was concluded that there were significant statistical differences in 9 factor groups. The women farmers suffer more from discomfort caused by mental burden, lack of rewards, social contacts, feeling of insecurity, unpleasant working conditions, feeling of responsibility and lack of support. Woman working as seamstresses, compared to woman farmers, experience more intense stress in connection with the feeling of insecurity caused by work organisation, as well as with lack of control ($p < 0.001$) (Tab. 2).

Women working in a farm household assigned higher weight to the impact of the majority of stress-inducing factors, compared to the women office clerks under examination. Only lack of control at the workplace is a factor which is more burdensome for those working in the office rather than for those working in their own farm household ($p < 0.001$, $p < 0.05$).

Comparing the burden accruing in office work and in the plant in which the examined seamstresses work, statistically significant differences were reported in 2 groups of

Table 3. Comparison of burden caused by stress-inducing factors present at place where women perform work in professional groups under examination.

Factors	p (levels of significance between groups)					
	I-II	II-III	II-IV	I-III	I-IV	III-IV
Feeling of mental burden	NS	0.001	0.001	0.001	0.001	NS
Lack of rewards	0.001	NS	NS	0.001	0.001	NS
Feeling of uncertainty caused by organisation	0.001	NS	0.001	0.001	0.001	NS
Social contacts	0.001	0.001	0.001	0.001	0.05	0.001
Feeling of insecurity	NS	0.001	0.001	0.001	0.001	NS
Physical discomfort	0.001	0.001	0.001	NS	0.001	NS
Unpleasant conditions	0.001	NS	NS	0.001	0.001	0.05
Lack of control	NS	0.001	0.05	0.001	0.05	NS
Lack of support	0.001	NS	NS	0.001	0.001	NS
Feeling of responsibility	0.001	0.001	NS	0.001	0.001	NS

factors. The seamstresses experience a stronger feeling of uncertainty caused by work organisation as well as physical discomfort as a stressful factor ($p < 0.05$).

Women working in agriculture, compared to women working as medical representatives, in fact, were more exposed to stress-inducing situations resulting from lack of rewards, lack of support at workplace, as well as experiencing more intensely physical discomfort and unpleasant working conditions. Working women employed in pharmaceutical companies were exposed to a greater extent to stress resulting from a feeling of uncertainty caused by organisation and social contacts ($p < 0.05$).

The working women employed in pharmaceutical companies as medical representatives experienced more severely – compared to women working physically in sewing plants – the exposure at work to such factors as: mental burden discomfort, feeling of uncertainty, social contacts, as well as the feeling of responsibility. On the other hand, the seamstresses experienced discomfort resulting from lack of control and physical discomfort at the workplace ($p < 0.05$).

In analysing the exposure to stress at work in the group of woman medical representatives and women working in offices it was concluded that there were considerable differences in 6 groups of stress-inducing factors. Medical representatives in their work are more exposed to experiencing mental burden, uncertainty caused by organisation and social contacts. Women performing office work have a higher level of stress connected with the feeling of uncertainty at the workplace, physical discomfort and lack of control ($p < 0.05$).

Analysis was made regarding average stress intensification among women under examination on the value of arterial pressure above norm ($>140/90$). The higher average stress cumulation at work had an inconsiderable impact on the RR value above 140/90 in the group of woman medical representatives, as well as in the group of women performing office work (respectively, medical representatives – 6.7 in the group subject to RR $<140/90$ mmHg and 8.9 in the

Table 4. Average values of stress intensification at workplace broken down by professional groups depending on RR value.

RR [mmHg]	Average values of stress intensification at workplace			
	Female farmers (I)	Female medical representatives (II)	Seamstresses (III)	Female clerks (IV)
$\leq 140/90$	8.1	6.7	7.0	6.1
$>140/90$	8.3	8.9	6.8	6.7
p	NS	0.05	NS	0.05

group subject to RR $>140/90$ mmHg; women clerks – 6.1 in the group subject to RR $<140/90$ mmHg and 6.7 in the group subject to RR $>140/90$ mmHg).

DISCUSSION

Epidemiological research suggests that the working environment, particularly work-related stress, plays an important role in the development of arterial hypertension [18, 22, 32, 37]. Each working individual is exposed to stress at the workplace, regardless of place of employment, industry, or position in the professional hierarchy, but more often than others it is experienced by young persons, elderly people, women, physically disabled persons, lonely individuals, newly recruited personnel whose predispositions, capabilities, knowledge, skills or professional experience are inadequate for the duties performed. Earlier studies showed that long working hours may be an environmental risk factor for the development of hypertension [10, 20, 21, 37, 39]. Statistics regarding stress-invoked illnesses are worrying. In Aleksandra Teisseyre's opinion, 40% of employees think that their work is very stressful, 25% think that work is the most stressful factor in their life; 75% of employees think that they experience more stress related to work than the previous generation; between 25–40% of employees experience "burn-out" syndrome originating from work, for which the reason is stress. Therefore, we can say that we have "epidemics" of stress [36].

The results of other authors show that the women's suitability for a job is negatively correlated with occupational stress [8]. It also translates into other roles which are performed by women at home [14, 40, 44], including duties as a mother [5].

Research shows that there is a dependence between workload and/or spasmodic and relaxant arterial pressure among the male population, but not among women. The research into the population of women includes a fewer number of women and shows lack of dependence between the analysed factors [6, 7, 28, 43].

The research into the female working population in Rio de Janeiro showed that 24% of the examined had arterial pressure above 140/90 mmHg and/or takes hypotension medicine. Work classified as "passive" (low demands and control) was associated to the greatest extent with higher values of arterial pressure among working women (28.3% among the examined group). Work classified as "low workload" (low demands and high control) had the lowest impact on higher values of arterial pressure – 20.9% of the examined from that group [3].

In the research study conducted by us in 3 groups of women under examination, the general feeling of stress remained on a high level. The highest average values were reported among the group of women working in agriculture, rather than among medical representatives and among women working as seamstresses. Women performing office work have results of intensified stress exposure within the limits of average values. High average values of stress intensification at the workplace are positively correlating with the increased values of arterial pressure among the group of women medical representatives and among women clerks.

On the basis of own research, it is possible to define factors at the workplace which, in the opinion of working women, are the most burdensome. In women's opinion, an unfriendly working environment is an environment where the feeling of mental workload results from lack of rewards (motivation), uncertainty resulting from the organisation of everyday tasks, and lack of support from other persons.

It was confirmed that the average arterial pressure was the highest among the group of medical representatives; values approaching the upper limit of the norm were also observed among the group of women performing office work. The lowest average value of arterial pressure was noted among seamstresses.

An American study conducted among different professional groups showed a bigger number of working men than women; however, in the group of women the higher percentage of women workers with arterial hypertension was reported. (16.1% of women as compared to 14.1% of men). The highest percentage of workers with arterial hypertension was noted among managing persons (managers) (17.1%). The percentage of persons suffering from arterial hypertension among a group of unskilled workers represented 16.6%, among skilled workers (15.2%) and among

office workers (15.2%). The lowest percentage of persons with a hypertension problem was reported in a group of professionals (14.9%), sales people (14.1%) and service providers (13.2%). It was concluded that the longer the working hours within a working week, the higher the percentage of persons with a hypertension problem [42].

Own study shows that women consider their work in agriculture as highly stressful, which may result from their commonly accepted less important role in a farm household than that of men, underestimating the importance of small tasks undertaken in the farmyard, which are most often the woman's duty, uncertainty resulting from production which is dependant on harvested crops or the occurrence of nature calamities, lack of support and lack of supervision over safety and health at work in agriculture. Women working in agriculture may be exposed to the same threats and risk as men; however, they are additionally exposed to other risks, mainly associated with fertility [35].

Women working in pharmaceutical companies as medical representatives also experience high degree of stress. Due to the fact that there is high competition on the market, the requirements in relation to a person working in such positions are constantly rising. Medical representative should have a personal acumen understood as a skill of coping with difficult, stressful situations and should also be reliable, punctual and hard-working. The work of a medical representative requires a high degree of independence, which is also often accompanied by a high degree of stress [23].

The specialists share the view that the job of commercial representative, both from the sales side and human resources perspective, could be performed for one company for several years as the maximum, after that the syndrome of professional "burn-out" appears [23]. Medical representative's work is also characterised by a high degree of uncertainty resulting from the possibility of losing the job.

Women performing physical work as seamstresses experience the feeling of uncertainty most intensively, caused by work organisation and lack of rewards. In the opinion of other authors, stress-inducing features of workers' work environment are: rush, necessity of focusing attention for a longer time, variability of tasks, imposed pace of work, fixed working hours, and surprise tasks to be performed, feeling of limiting control over the situation at work, uneven distribution of workload over time, and physical working conditions [12]. Women performing physical work experienced more often than women in other groups, pre-menstruation problems, as well as disturbances and discomfort during menstruation. Among 40% of women, the intensification of those symptoms was high. Physical exertion had the most considerable impact on those discomforts [34].

Own study showed that the lowest number of stress-inducing factors was present in office work. In the authors' opinion, the main stress-inducing features of the office workers' work are: necessity of focusing attention for a

longer time, variability of tasks, rush, financial liability, severe consequence for making a mistake when performing a clerk's duties, and thinking about work at home. The office working environment is abundant in physical strain and mental tensions which are easily prone to somatisation [12]. Some office workers also exhibited anxiety disorders. These were mainly caused by the aggressive behaviour of some petitioners. Such aggressive conduct caused profession-related stress reaction, the loss of meaning of the work performed and professional "burn-out" [26].

Research into the pregnant women population (69.6% of women are working) regarding the most frequently noted stress-inducing features of their work, showed the following: big amount of work, limited freedom in performing work and decision-taking, necessity of constant concentration on work, imposed tempo of work, deadline orientated tasks, monotony and lack of support. This problem is particularly present among women in rural areas, with low educational input, or doing a physical job [35].

In own study, higher average stress intensification at a workplace had a considerable impact on the RR value exceeding 140/90 in the group of woman medical representatives, as well as in the group of woman clerks.

Studies conducted by other authors show a bigger impact of the burden caused by mental factors at work on the increase of arterial pressure among male population, and only a slight impact among the female population performing mental work [19]. Similar results were obtained in the studies of Italian authors who concluded that among the male population, together with the change from a small to a big burden of mental factors at work, the spasmodic pressure increases by 3 mmHg. Such a dependence was not observed among the group of working women [11].

On the other hand, French authors have concluded the existence of stronger dependencies between mental load at work and the arterial pressure among women rather than among men [29].

CONCLUSIONS

Stress experienced by women at the workplace affects not only their professional life, but also family life and social intercourses. In the women's opinion, an unpleasant workplace is a workplace where the feeling of mental workload is connected with the lack of rewards (motivation), and uncertainty resulting from organisation of daily chores and lack of support from others. A high general level of stress was noted among the group of women working in agriculture, in pharmaceutical companies, as well as among those who perform physical work (seamstresses). The intensification of stress at a workplace had a considerable impact on the value of arterial pressure among the group of woman medical representatives, as well as among the group of woman office workers. No significant dependencies have been concluded between socio-demographic variables and the general level of exposure to intensified

stress in the examined professional groups. The above research confirms the needs for further examination of working women's environment and its impact on health.

Obviously, attempts should be made in order to improve the conditions of work for women, bearing in mind the fact that the adoption of a neutral attitude towards the sexes when assessing risk and undertaking preventive activities may result in the female gender being underestimated or even disregarded.

REFERENCES

1. *Adapting to change in work and society: A new Community strategy on health and safety at work, 2002–06*. Communiqué of European Union, COM (2002).
2. *AHA Scientific Sessions*, Chicago 2002.
3. Alves MGM, Faerstein E, Werneck GL, Lopes CS: Job strain and hypertension in women: Estudo Pro-Saude (Pro-Health Study). *Rev Saude Publica* 2009, **43**, 1–4.
4. *Analyzing and Anticipating Change to Support Socio-Economic Progress, Four Year Rolling Programme 2001–2004*. European Foundation for the Improvement of Living and Working Conditions, Dublin 2000.
5. Arafa MA, Amine T, Abel Fattah M: Association of maternal work with adverse prenatal outcome. *Can J Public Health* 2007, **98**, 217–221.
6. Belkic KL, Landsbergis PA, Schnall PL, Baker D: Is job strain a major source of cardiovascular disease risk? *Scand J Work Environ Health* 2004, **30**, 85–128.
7. Brisson C: Women, work and cardiovascular disease. *Occup Med State Art Rev* 2000, **15**, 49–57.
8. Bugajska J, Makowiec-Dąbrowska T, Lewandowski Z: Poziom ogólnej wydolności fizycznej oraz stresu zawodowego a zdolność do pracy u aktywnych zawodowo osób w Polsce. *Ann Acad Med Siles* 2006, **60(Suppl. 95)**, 127–131.
9. Carroll D, Smith G: Blood pressure reactions to acute psychological stress and future blood pressure status. *Psychosom Med* 2001, **63**, 744–746.
10. Caruso C, Hitchcock EM, Dick RB, Russo JM, Schmit JM: *Overtime and Extender Work Shifts: Recent Findings on Illnesses, Injuries and Health Behaviors*. National Institute for Occupational Safety and Health, Cincinnati, OH 2004.
11. Cesana G, Sega R, Ferrario M, Chiodini P, Corrao G, Mancia G: Job Strain and Blood Pressure in Employed Men and Women: A Pooled Analysis of Four Northern Italian Population Samples. *Psychosom Med* 2003, **65**, 558–563.
12. Drabek M: Poziom narażenia na stres pochodzenia zawodowego w zakładach pracy. In: *Seminarium Okręgowego Inspektoratu Pracy w Łodzi „Stres w pracy” – 15 November 2006*.
13. *Emerging Thematic Priorities for research in Europe*, Working Paper, Institute for Prospective Technological Studies, Seville, 4 December 2000. Available from: priorities.jrc.es/.
14. Erlandsson LK, Eklund M: Women's experiences of hassles and uplifts in their everyday patterns of occupations. *Occup Ther Int* 2003, **10**, 95–114.
15. *Future Occupational Safety and Health Research Needs and Priorities in the Member States of the European Union*. European Agency for Safety and Health at Work, Bilbao 2000.
16. *Gender Issues in Safety and Health at Work*. European Agency for Safety and Health at Work, Luxembourg: Office for Official Publications of the European Communities, 2003.
17. Grabowski P: Stres w miejscu pracy – kosztowny i niebezpieczny. *Antidotum* 2002, **12**, 41–45.
18. Greiner BA, Krause N, Ragland D, Fisher JM: Occupational stressors and hypertension: a multi-method study using observer-based job analysis and self-reports in urban transit operators. *Soc Sci Med* 2004, **59**, 1081–1094.
19. Guimont C, Brisson C, Dagenais GR, Milot A, Vezina M, Masse B, Moisan J, Laflamme N, Blanchette C: Effect of job strain on blood pressure: a prospective study of male and female white-collar workers. *Am J Publ Health* 2006, **98**, 1436–1443.

20. Harma M: Are long work hours a health risk? *Scand J Work Environ Health* 2003, **29**, 167–169.
21. Landsbergis P: Long work hours, hypertension, and cardiovascular disease. *Cad Saude Publica* 2004, **20**, 1746–1748.
22. Landsbergis PA, Schnall PL, Pickering TG, Warren K, Schwartz JE: Lower socioeconomic status among men in relation to the association between job strain and blood pressure. *Scand J Work Environ Health* 2003, **29**, 206–215.
23. Lisowska B: Rotacja na stanowiskach przedstawicieli medycznych. *Puls Med* 2008, **2**, 165.
24. Mazurkiewicz M: Style radzenia sobie w sytuacji trudnej u kobiet i mężczyzn. *Sztuka Leczenia* 1998, **4**, 49–54.
25. Nakanishi N, Yoshida H: Long working hours and risk for hypertension in Japanese male white collar workers. *J Epidemiol Community Health* 2001, **55**, 316–322.
26. Nowicka M, Kolasa W: W obliczu agresywnego petenta - konsekwencje psychologiczne dla pracowników. *Med Pr* 2001, **52**, 1–5.
27. Official Journal of the European Communities, C 51/33, 23.2.2000.
28. Ohlin B, Berglund G, Nilsson PM, Melander O: Job strain, decision latitude and alpha 2B-adrenergic receptor polymorphism significantly interact, and associate with higher blood pressures in men. *J Hypertens* 2007, **25**, 1613–1619.
29. Radi S, Lang T, Lauwers-Cances V, Diene E, Chatellier G, Larabi L, De Gaudemaris R: Job constraints and arterial hypertension: different effects in men and women: the IHPAF II case control study. *Occup Environ Med* 2005, **62**, 711–717.
30. Saab P, Llabre M: Cardiovascular responsivity to stress in adolescents with and without persistently elevated blood pressure. *J Hypertens* 2001, **19**, 21–27.
31. *Sprawozdanie Głównego Inspektora Pracy z działalności Państwowej Inspekcji Pracy w 2006 roku*. Warsaw 2006.
32. Steptoe A, Willemsen G: The influence of low job control on ambulatory blood pressure and perceived stress over the working day in men and women from the Whitehall II cohort. *J Hypertens* 2004, **22**, 915–920.
33. Steward J, France C: Cardiovascular recovery from stress predicts longitudinal changes in blood pressure. *Biol Psychol* 2001, **58**, 105–120.
34. Studenski R: *Organizacja Bezpiecznej Pracy w Przedsiębiorstwie*. Politechnika Śląska, Gliwice 1996.
35. *Tackling stress: Management standards approach*. Health & Safety Executive (HSE). London 2005.
36. Teisseyre A: *Nowe spojrzenie na stres*. Available from: eksperci.nf.pl/artykuly/arttykul_5845.htm.
37. Tsutsumi A, Kayaba K, Tsutsumi M, Igarashi M: Association between job strain and prevalence of hypertension: a cross sectional analysis in a Japanese working population with a wide range of occupations: the Jichi Medical School cohort study. *Occup Environ Med* 2001, **58**, 367–373.
38. Tsutsumi A, Kayaba K: Association between job strain and prevalence of hypertension: a cross sectional analysis in Japanese working population. *Occup Environ Med* 2001, **58**, 367–382.
39. van der Hulst M: Long work hours and health. *Scand J Work Environ Health* 2003, **29**, 171–188.
40. Wagener DK, Walstedt J, Jenkins L, Burnett C, Lulich N, Fingerhut M: Women: work and Health. *Vital Health Stat* 1997, **31**, 1–91.
41. *Wtyczne do programu informacyjnego skierowanego do Pracodawców: Przeciwdziałanie negatywnym skutkom przeciążenia psychicznego i stresu zawodowego w miejscu pracy*. Departament Prewencji Głównego Inspektoratu Pracy w Warszawie, Warsaw 2006.
42. Yang H, Schnall PL, Jauregui M, Su T-Ch, Baker D: Work hours and self-reported hypertension among working people in California. *Hypertension* 2006, **48**, 744–750.
43. Yu SF, Zhou WH, Jiang KY, Gu GZ, Wang S: Job stress, gene polymorphism of beta2-AR, and prevalence of hypertension. *Biomed Environ Sci* 2008, **21**, 239–246.
44. Zeytinoglu IU, Seaton MB, Lillevik W, Moruz J: Working in the margins women's experiences of stress and occupational health problems in part-time and casual retail jobs. *Women Health* 2005, **41**, 87–107.