

Psychosocial factors and health status of employees at the Poznan University of Medical Sciences

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Abstract

Introduction: New opportunities in the labour market, competition in services and globalization have contributed to the increase in load factors in the psychosocial work environment. Availability, readiness to help, work with the sick, the suffering patient – night shifts, overtime, workaholic (as a new form of addiction), and bullying – are becoming more pronounced causes of stress, fatigue and burnout in medicine. Thus, difficult working conditions are largely the cause of unhealthy lifestyles in the medical professions and foster the development of various types of addiction and physical illness. The negative effects of psychosocial factors – in the form of immune disorders, increased incidence of mental and somatic diseases, and metabolic and hormonal disorders – more often cause increase absence through sickness and the shortening of working life.

Objective: The main aim of the presented study was to provide results concerning the health state of employees of the Poznan University of Medical Sciences (PUMS), and also to analyze relations between selected psychosocial risks factors and the state of health of PUMS employees.

Material and methods: The results of research conducted in 2009–2010 which covered 2,468 employees of the PUMS and the results of studies using an anonymous own questionnaire survey, evaluating exposure to psychosocial factors, which included the 1,096th members of staff of the PUMS.

Results: There was a clear effect of psychosocial risk factors for health workers. The greatest burden of these factors was observed among workers with higher education, mostly doctors. This occupational group also worked in several places of work more often than other employees of the university. These workers often complained of chronic fatigue, recurrent respiratory infections, hypertension, sleep disorders, neurotic disorders and depression. The complaints quite often diagnosed were immune disease, allergies, skin diseases, gastrointestinal diseases, and disorders of carbohydrate and lipid metabolism, which clearly intensified under stress. The clearest negative impact of psychosocial factors on the health of the workers were observed in those with higher education, employed at several jobs, and complained about poor work organization.

Conclusions: 1) It is necessary to implement prevention programs for the staff of the PUMS, aimed at the primary and secondary negative impact of psychosocial factors. 2) Psychological counseling is advisable for employees. 3) It is essential that the issue of voice training, and interpersonal communication techniques to teach and control the schedule of classes, in order to reduce the workload, and encourage physical activity and other forms of relaxation. 4) It is advisable to periodically check on the work conditions and organization of work to help eliminate stressors in the work environment.

Key words

occupational hazards, psychosocial factors, stress, medical university

INTRODUCTION

The contemporary labour market – as a result of numerous transformations and new employment opportunities – also brings a new kind of threat to the workplace. The importance of psychosocial factors clearly increases, which – as a result of changes in working conditions – are more often transformed and become a harmful burden which results in adverse health effects [1]. The largest study conducted in Europe (ESENER) on occupational health and safety confirmed a marked increase in the risk of psychosocial factors, such as stress, bullying and harassment [2].

Briefly, the risk factor for psychosocial, psychosocial hazards is defined as 'a state induced by employee perceptions

of phenomena in the work environment, which are assessed as unfavorable or dangerous' [3]. Another definition of psychosocial hazards in the workplace, presented by psychologists from the Institute of Occupational Medicine in Łódź, is: 'any kind of stimulus / situation which affects the human psychological mechanisms by causing damage in the form of interference in functioning and good health disorders' [4]. Receiving signals in a negative environment largely depends on the subjective assessment of the employee. Psychosocial factors in hazardous situations in the workplace arise in cases of poor work organization, lack of a sense of stability when the boss makes unreasonable demands or uses bullying tactics in the workplace, or there are conflicts between co-workers – i.e. under bad conditions. An employee who has low qualifications and feels the working environment to be very stressful, will be interpreted differently from the danger that has the appropriate skills, does not feel peer pressure and stress, and can cope with stress.

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The operation of psychosocial factors occurs through the mechanism of stress and the effects of this impact will depend on:

1. working environment;
2. personal characteristics of the individual;
3. the subjective stressor.

Psychosocial factors – considered to be significant stressors in the work environment – adversely affecting the health of employees – and can be divided into the following categories [5]:

1. those associated with the type of work:
 - a) variability of tasks;
 - b) need for constant attention;
 - c) tasks requiring great mental effort;
 - d) continuously new challenges;
 - e) monotony and repetition of work;
 - f) exercise.
2. Work of the organization:
 - a) top-down setting the pace of work;
 - b) fixed/rigid working hours;
 - c) permanent haste, associated with the number of vacancies;
 - d) supervising the work (strict breaks, constant control);
 - e) role conflict;
 - f) lack of procedures.
3. Work requiring constant communication between:
 - a) competition;
 - b) the need to compromise;
 - c) social isolation;
 - d) assistance;
 - e) ambient aggression;
 - f) bullying.
4. Maladjustment of working conditions to the needs of employees:
 - a) low social prestige;
 - b) employee's excessive ambition;
 - c) responsibility for people;
 - d) threat to life or health
 - e) difficulties in controlling work;
 - f) moral dilemmas.
5. Interference problems resulting from links with jobs – home:
 - a) excessive working hours;
 - b) availability;
 - c) workaholism;
 - d) system of shift work.
6. Arduous working conditions:
 - a) adverse environmental conditions of work (noise, abnormal climate, poor lighting, forced posture, lifting);
 - b) unpleasant conditions in the working environment (clean, aromatic).

The factor for these negative feelings by working trigger stress, which in small doses can act mobilized, but too many action may cause fear of action and even a 'paralyzing fear' [5, 6, 7, 8].

Stress acts on the body through various mechanisms and committed 'to work' not only on both the central and autonomic nervous system, but also on the endocrine system. The 'cooperation' of the hypothalamus-pituitary-adrenal axis is achieved by using hormones, neurotransmitters and neuromodulators [5]. During the action of stress, there is an increased secretion of glucocorticoids, catecholamines (dopamine, epinephrine and norepinephrine), cortisol and cortisone, and stimulates glycolysis and lipolysis. The effect of such actions are measurable health effects, some of which are shown in Table 1.

Stress, by weakening the immune system (impact on the production of lymphocytes, telomere shortening) accelerates the aging process of cells, and the development of somatic diseases, including cancer, infections and immunologic diseases [6, 7]. Stimulating the secretion of cortisol causes symptoms of cardio-vascular, gastrointestinal, and endocrine diseases. However, the most negative impact on the mental sphere leads to chronic fatigue, burnout, depression and neuroticism. This may cause inappropriate behaviour and lead to addiction and even suicide attempts [9, 10, 11, 12, 13].

Table 1. Health effects of stress [5].

System	Disease
Cardiovascular disease	hypertension ischemic heart disease myocardial infarction stroke
Gastrointestinal	stomach and duodenum ulcers irritable bowel syndrome non-specific inflammatory bowel disease
Nervous	depression anxiety neurosis sleep disorders
Immune	allergies infections cancers
Endocrinal	disorders of menstruation impaired fertility hypercholesterolaemia hyperglycaemia

Objective: The main objective of the study was to provide results of research concerning the state of health of employees at the Poznań University of Medical Sciences (PUMS), and also to analyze relations between selected psychosocial risks factors and the state of health of PUMS employees.

MATERIALS AND METHOD

The research materials collected in 2009–2010 were:

1. prevention studies (conducted in accordance with the Labour Code) of 2,486 employees of Poznań University of Medical Sciences (PUMS), of which 884 were males and 1,602 were females.
2. The data were collected using an anonymous own questionnaire survey which was completed by the 1,096 employees (648 females and 448 males) during periodic examinations at the Occupational Medicine Clinic of PUMS. The questions focused on psychosocial factors at work. Among the employees of the University, 791 (31.82%) physicians completed the survey of whom 368 (33.65%) were doctors.



RESULTS

Referrals for prophylactic examinations.

Analysing the referrals for examinations, there was insufficient information about the exposure of superiors in the workplace. Even worse was the knowledge of the superiors about the harmful psychosocial factors, which were underestimated.

Prophylactic examinations under the Labour Code.

Prophylactic examinations of the employees revealed a large percentage with hypertension (32.82%), allergy (23.61%), and lipid disorders (68.41%). Slightly fewer employees had diseases of the musculoskeletal system (21.80%), gastrointestinal diseases (18.02%), laryngological diseases (14.6%), and endocrine diseases (12.71%). 9.68% of the respondents had diabetes, of whom 29.49% had fasting hyperglycaemia; immune thyroiditis was found in 2.12% of employees, while nearly 91% of these cases concerned the doctors.

Studies using a questionnaire.

The survey showed that 84% of employees felt the negative effects of mental stress. Stress was examined according to three-scales: small, medium and large. Most employees – 48%, indicated the amount of perceived stress as average, 24% felt stress as large, and only 12% as small. Doctors accounted for up to 97% of cases, while 48% rated their stress as average, 44% as large, and only 5% as small (Fig. 1).

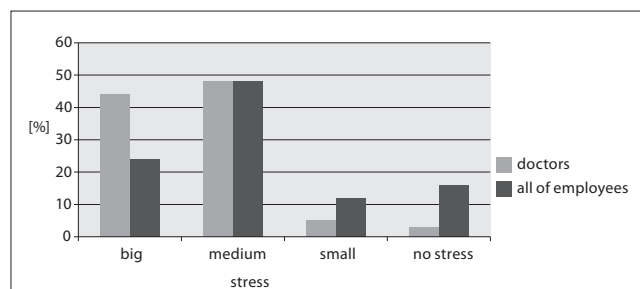


Figure 1. Comparison of opinions on the amount of stress associated with work between the total PUMS staff and University physicians.

Shift work was performed by 339 (30.93%) of the total respondents, while 182 (16.61%) performed night shift. Both cases were dominated by those with a higher education. Harassment was indicated by 212 people, 19.34% of the total surveyed, the highest in this group were employees with higher education (20.88%), and the least with the elementary (7.14%). Harassment among doctors registered at 18.72% of cases. Workaholism was admitted in 319 (29.45%) of respondents, of whom up to 38.86% were among the doctors. More than half of the respondents (53%) were employed in more than one workplace. This group was also dominated by those with higher education (58%), and among them doctors (81%).

Chronic fatigue was experienced by 495 respondents (45.16%), including 47.56% of those with higher education and 59.24% of doctors. Employees in 128 cases (11.68%) reported chronic diseases, which in their opinion were directly or indirectly related to work. Sleep disturbances were reported by 10.60% of respondents. Mental illnesses were indicated by 10.14% of respondents, primarily those with secondary or vocational education. In the questionnaire survey, 31.12% reported symptoms of diseases of the locomotor system than

Table 2. Analysis of the impact of stress on the incidence of chronic disease – according to an opinion survey and use of the U Mann-Whitney test.

Parameter		no stress	little stress	average stress	big stress	Statistical significance
Chronic fatigue	Yes	35 (7.07%)	42 (8.48%)	226 (45.66%)	192 (38.79%)	p<0.0001
	No	141 (23.46%)	91 (15.14%)	291 (15.14%)	78 (12.98%)	
	601					
Chronic diseases	Yes	10 (7.81%)	7 (5.47%)	54 (42.19%)	57 (44.53%)	p<0.0001
	No	166 (17.15%)	126 (13.02%)	463 (47.83%)	213 (22.00%)	
	968					
Allergy	Yes	27 (14.06%)	29 (15.10%)	89 (46.35%)	47 (24.48%)	p=0.9538
	No	148 (16.37%)	104 (11.50%)	428 (47.35%)	224 (24.78%)	
	904					
Skin diseases	Yes	10 (19.23%)	0 (0.00%)	26 (50.00%)	16 (30.77%)	p=0.2234
	No	166 (15.90%)	133 (12.74%)	491 (47.03%)	254 (24.33%)	
	1044					
Diabetes	Yes	5 (19.23%)	2 (7.69%)	14 (53.85%)	5 (19.23%)	p=0.7007
	No	171 (15.98%)	131 (12.24%)	503 (47.01%)	265 (24.77%)	
	1070					
Neurosis	Yes	9 (12.68%)	7 (9.86%)	31 (43.66%)	24 (33.80%)	p=0.0788
	No	167 (16.29%)	126 (12.29%)	486 (47.41%)	246 (24.00%)	
	1025					
Depression	Yes	4 (10.26%)	6 (15.38%)	14 (35.90%)	15 (38.46%)	p=0.1215
	No	172 (16.27%)	127 (12.02%)	503 (47.59%)	255 (24.12%)	
	1057					
Hypertension arterial	Yes	20 (11.36%)	18 (10.23%)	82 (46.59%)	56 (31.82%)	p=0.0052
	No	155 (16.85%)	115 (12.50%)	435 (47.28%)	215 (23.37%)	
	920					
Coronary artery disease	Yes	2 (16.67%)	4 (33.33%)	4 (33.33%)	2 (16.67%)	p=0.2234
	No	174 (16.05%)	128 (11.81%)	513 (47.32%)	269 (24.82%)	
	1084					
Irritable bowel syndrome	Yes	9 (12.16%)	9 (12.16%)	37 (44.59%)	23 (31.08%)	p=0.1780
	No	167 (16.34%)	125 (12.23%)	484 (47.36%)	246 (24.07%)	
	1022					
Lipid disorders	Yes	4 (6.35%)	5 (7.94%)	27 (42.86%)	27 (42.86%)	p=0.0002
	No	172 (16.65%)	128 (12.39%)	490 (47.43%)	243 (23.52%)	
	1033					
Sleep disorders	Yes	7 (5.83%)	10 (8.33%)	58 (48.33%)	45 (37.50%)	p<0.0001
	No	169 (17.32%)	123 (12.60%)	458 (46.93%)	226 (23.16%)	
	976					
Thyroid diseases	Yes	10 (10.87%)	15 (16.30%)	50 (54.35%)	17 (18.48%)	p=0.6623
	No	166 (16.53%)	118 (11.75%)	467 (46.51%)	253 (25.20%)	
	1004					
Cancer	Yes	2 (12.50%)	2 (12.50%)	8 (50.00%)	4 (25.00%)	p=0.8136
	No	174 (16.11%)	131 (12.13%)	509 (47.13%)	266 (24.63%)	
	1080					
Ulcer disease	Yes	5 (8.33%)	5 (8.33%)	28 (46.67%)	22 (36.67%)	p=0.0092
	No	171 (16.51%)	128 (12.36%)	489 (47.20%)	248 (23.94%)	
	1036					
Musculo-skeletal pain syndromes	Yes	50 (14.12%)	28 (7.91%)	158 (44.63%)	118 (33.33%)	p=0<0001
	No	126 (16.98%)	105 (14.15%)	359 (48.38%)	152 (20.49%)	
	742					

during the examinations (21.80%). Irritable bowel syndrome was reported by 6.48%, 5.11% with ulcers.

Males employed in the University (77.91%) felt big and mean amounts of stress significantly more often than the females (67.6%) ($p = 0.0002$). Employees with higher education reported exposure to high stress levels and, on average, this was four times more likely than in other occupational groups ($p = 0.0001$). Employees who worked in several factories (2–5) reported significantly more exposure to large and medium stress than those employed only in a single factory ($p < 0.00001$). Shift work was up to 4.12 times more likely to increase the chance of stress experienced by workers in large and medium degrees, compared with those who experienced stress to a small degree, or did not feel it at all ($p < 0.0001$). Among those employees who worked at night, the chance of feeling large and average stress was up 7.52 times greater ($p < 0.0001$). Exposure to high and average stress was more than three times as likely to be the cause of chronic fatigue syndrome than among those with little experience of stress or lack of it ($p < 0.0001$). Those with high or average stress were 2.82 times more likely to report chronic diseases and work-related stress than those who experienced little or no exposure to stress ($p < 0.0001$). Workaholics reported significantly more stress – large and medium, than small or no stress ($p < 0.0001$). Employees who at work were exposed to bullying were more than four times more likely to feel stress, than those who experienced large and small stress, or its absence ($p < 0.0001$). Among the respondents, a statistically significant increase was observed in the incidence of some chronic diseases associated with exposure to large and medium stress, including: hypertension (1.51 times more often; $p = 0.0432$), lipid disorders (2.45 times more often; $p = 0.0171$), sleep disturbances (2.59 times more often; $p = 0.0004$), fatigue (more than three times more often; $p < 0.0001$) and musculoskeletal pain syndromes (1.6 times more often; $p = 0.0021$). Other chronic diseases reported by the respondents did not show statistical significance in relation to exposure to large and medium stress (Tab. 2).

Considering exposure to bullying and level of education, the increase in bullying is observed with increased level of education. Employees with higher education and experienced bullying accounted for 0.88% of respondents, significantly less was experienced by staff with secondary education (14.01%) and vocational education (16.33%), while the lowest was among those with primary education (7.13%). Employees with higher education were 1.66 times more often exposed to bullying than workers in other occupational groups (Tab. 3). Between males and females there was no statistical significance in exposure to bullying ($p = 0.1257$). Persons employed in two or more jobs were twice as likely at risk of bullying than those working only in the University ($p < 0.00001$). Among those working to change the perception of opportunities for bullying, this was about 1.74 times higher than among those working a single shift ($p = 0.0005$). The situation was similar among those working at night, because the amount of bullying experienced was 1.95 times higher than among those not working at night ($p = 0.0004$). Among those exposed to bullying, there were increased chances – 3.18 times, of increasing the number of different chronic diseases ($p < 0.0001$) related to work; among other things – 3.48 times more chronic fatigue was experienced than among those not reporting harassment in the workplace ($p < 0.0001$). Workaholics were also 1.76 times more likely to

Table 3. Statistical analysis of the relationship between diseases recognizable among the respondents caused by their experience of bullying in the workplace. The χ^2 test with Yates' correction test, Mann-Whitney U and Fisher's exact test were used.

Parameter	Bullying – yes; n=212	Bullying – no; n=884	Statistical significance	The odds ratio The confidence interval
Gender: females	115 (54.25%)	533 (60.29%)	$p=0.1257^*$	-
males	97 (45.75%)	351 (39.71%)		
Age: mean minimum/maximum	43.93±10.12 25–67	43.63±11.59 20–79	$p=0.5324^{**}$	-
Education: higher, secondary vocational, primary	32 (15.09%) 180 (84.91%)	202 (22.85%) 682 (77.15%)	$p=0.0172^*$	OR=1.66 1.10–2.50
Chronic fatigue	147 (69.34%)	348 (39.37%)	$p<0.0001^*$	OR=3.48 2.525 – 4.805
Chronic diseases	50 (23.58%)	78 (8.82%)	$p<0.0001^*$	OR=3.18 2.15–4.72
Allergy	39 (18.40%)	153 (17.33%)	$p=0.7895^*$	-
Skin diseases	9 (4.25%)	43 (4.87%)	$p=0.8383^*$	-
Diabetes	3 (1.42%)	23 (2.60%)	$p=0.4422^*$	-
Neurosis	28 (13.21%)	43 (4.86%)	$p<0.0001^*$	OR=2.97 1.80–4.91
Depression	16 (7.55%)	23 (2.60%)	$p=0.001^*$	OR=3.05 1.58–5.88
Arterial hypertension	38 (17.92%)	138 (15.65%)	$p=0.4798^*$	-
Coronary artery disease	1 (0.47%)	11 (1.24%)	$p=0.5499^*$	-
Irritable bowel syndrome	22 (10.48%)	52 (5.89%)	$p=0.0261^*$	OR=1.87 1.10–3.15
Lipid disorders	192 (90.57%)	841 (95.14%)	$p=0.0163^*$	OR=2.03 1.17–3.54
Sleep disorders	49 (23.11%)	71 (8.04%)	$p<0.0001^*$	OR=3.43 2.30–5.13
Thyroid diseases	20 (9.43%)	72 (8.14%)	$p=0.6383^*$	-
Ulcer disease	24 (11.32%)	36 (4.07%)	$p<0.0001^*$	OR=3.00 1.75–5.16
Cancer	3 (1.42%)	13 (1.47%)	$p=0.7962^*$	-
Musculo-skeletal pain syndromes	87 (41.23%)	267 (30.20%)	$p=0.0027^*$	OR=1.62 1.19–2.20

* χ^2 test with Yates' correction

** U Mann-Whitney test

experience fatigue than those who experienced bullying, but which did not depend on the work ($p = 0.0005$). Employees who also experienced bullying, also had a 2.97 times more incidence of neurotic disorders ($p = 0.0002$), 3.05 times more likely to depression ($p = 0.001$), 1.87 times more likely to have irritable bowel syndrome ($p = 0.0261$), 2.03 times more likely for lipid disorders ($p = 0.0162$), 3.43 times more likely to sleep disturbances ($p < 0.0001$), 3.00 times more likely to peptic ulcer disease ($p = 0.001$) and 1.62 times more likely to musculoskeletal pain syndromes ($p = 0.0027$), compared with those who did not experience bullying. Other chronic diseases indicated by the surveyed employees did not show statistically significant increases in morbidity associated with exposure to bullying [12, 13, 14, 15, 16].



CONCLUSIONS

Contemporary working conditions need to be inspected to verify the type and size of occupational hazards. Employers underestimate the risks arising from psychosocial factors, social processes, the size and effect of which continually increases, resulting in adverse effects for health as well as on the social and economic level.

The presented study demonstrates the adverse effects of psychosocial factors in the pathogenesis of stress. Exposure to stress was indicated by 84% of the staff of the University, of whom as many as 97% were physicians employed as full-time academics. Most of the employees felt the stress to be average; next came great stress, experienced mostly by doctors. These results testify to the increasing exposure to stress in the workplace, which requires more attention during risk assessment, taking into account the psychosocial factors of work, all the more so because the labour market forces certain behavior which is detrimental for the employees. Unfortunately, there is a tendency for exposure to psychosocial factors to increase. It was found that a far greater exposure to psychosocial factors was experienced by employees with higher education. They also fell ill more often than other professional groups, suffering from allergies, frequent infections, immunologic diseases, hypertension and lipid disorders, as well as fasting hyperglycemia often being diagnosed. Those with secondary, vocational and elementary education were often overweight or obese, had type 2 diabetes and coronary heart disease.

More and more people are becoming addicted to work, especially those with a higher education. Night-shift work was also performed by the great majority of employees with a higher education, and this group also more frequently experienced bullying. This problem affected a similar proportion of doctors. Experiencing bullying by staff often resulted from poor organization of work and lack of interpersonal communication skills.

Employees often coupled them with the occurrence of chronic illness and work. Much more often, people admitted to mental illness than during examinations. Analysis of periodic surveys and studies suggests that employees people with higher education are reluctant to provide information about their mental illness. This may result from the fear of losing the ability to work.

Because most psychosocial risks depend on the subjective assessment of the employee, the question arises: whether or not they should be entered on the referral for examinations by the same employee? Then, one part of the referral would be written by the supervisor and the other by the employee. This would give a fuller picture of the occupational hazards in the workplace.

Constant monitoring of the working environment is the basis for the prevention of work-related diseases. Effective prevention in this area should proceed in several stages, starting with identification of the hazards, through risk assessment, implementation of appropriate strategies and their monitoring and systematic evaluation of risk [7]. In this strategy an important role should be played by the same employee who – completing the appropriate questionnaire focused on work organization and interpersonal relations – can affect the elimination or reduction of the negative impact of psychosocial factors on health employees [16, 17, 18].

CONCLUSIONS

1. Analysis of referrals to the study showed a lack of knowledge of preventive psychosocial factors among the managers of the University.
2. The role of psychosocial factors as a hazard in the workplace is growing.
3. Stress as a result of the negative impact of psychosocial factors in the workplace is becoming the most serious threat to the health of workers.
4. Employers should intensify efforts to reduce the risk of harmful effects of psychosocial factors on health workers.
5. What is needed is periodic inspection of employee job satisfaction, which will help to identify stressors in the workplace and early enough to prevent their negative effects.

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