

# PSYCHOSOCIAL WORK ENVIRONMENT RISK FACTORS AMONG UNIVERSITY EMPLOYEES - A CROSS-SECTIONAL STUDY IN HUNGARY

## DEJAVNIKI PSIHOLOGIČNEGA TVEGANJA NA DELOVNEM MESTU MED ZAPOSLENIMI NA UNIVERZI - PRESEČNA ŠTUDIJA NA MADŽARSKEM

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### ABSTRACT

#### Keywords:

occupational stress, subjective health, mental health

**Introduction:** National and international research results have highlighted the fact that workplace stress causes mental and somatic problems. The aim of the present paper is to define exposure to workplace-related risk factors, with special focus on psychosocial risk factors, and the way they interconnect with workplace conditions, relationships with superiors and colleagues, and moral, professional and financial appreciation.

**Methods:** Cross-sectional research with the help of an anonymous online self-administered questionnaire was carried out among 261 higher education employees (67% women, 33% men, mean age 43.4 years) from 12 faculties of the University of Szeged, Hungary. Statistical analysis was performed using IBM SPSS 22.0.

**Results:** The primary workplace stress factors for university employees were strict deadlines (80.4%), frequent overwork (64.2%) and difficulty in meeting requirements (56.7%). Communication problems with colleagues and superiors were also highlighted (47.5%). Job strain was higher for women than for men. With regard to low financial, professional, and moral appreciation, employees were characterised by the existence of work requirements impossible to meet, as well as by low autonomy. Experience of anxiety and aggression came along with low financial and moral appreciation ( $p < 0.001$ ).

**Conclusions:** Our data suggests that employees at the university were subject to several psychosocial risk factors, and worked under considerable mental stress, leading to a higher prevalence of mental health problems. The results highlight the need for a health-focused policy-making in higher education to reduce health expenditure and increase efficiency at work.

### IZVLEČEK

#### Ključne besede:

poklicni stres, subjektivno zdravje, duševno zdravje

**Uvod:** Rezultati nacionalnih in mednarodnih raziskav kažejo, da stres na delovnem mestu povzroča duševne in telesne težave. Cilj tega članka je opredeliti izpostavljenost dejavnikom tveganja, povezanim z delovnim mestom, posebej psihosocialnim dejavnikom, in njihovo medsebojno povezanost z razmerami na delovnem mestu, odnosi z nadrejenimi in sodelavci ter moralnim, poklicnim in finančnim zadovoljstvom.

**Metode:** Izvedli smo presečno raziskavo s pomočjo anonimnega spletnega samoocenjevalnega vprašalnika, ki ga je izpolnilo 261 zaposlenih v visokošolskem izobraževanju (67,0 % žensk, 33,0 % moških; starost moških je bila 43,4 leta) iz 12 fakultet Univerze v Szegedu na Madžarskem. Statistično analizo smo opravili s programom IBM SPSS 22.0.

**Rezultati:** Primarni dejavniki stresa na delovnem mestu pri zaposlenih na univerzi so bili strogi roki (80,4 %), pogosta preobremenjenost (64,2 %) in težave pri izpolnjevanju zahtev (56,7 %). Izpostavljene so bile tudi težave pri komunikaciji s sodelavci in nadrejenimi (47,5 %). Delovni napori so bili večji pri ženskah kot pri moških. V primeru nizkega finančnega, poklicnega in moralnega zadovoljstva je bilo za zaposlene značilno, da obstajajo delovne zahteve, ki jih je nemogoče izpolniti, in da imajo nizko stopnjo avtonomije. Z nizkim finančnim in moralnim zadovoljstvom je bil povezan občutek anksioznosti in agresije ( $p < 0,001$ ).

**Zaključki:** Naši podatki kažejo, da so se zaposleni na univerzi pri delu spopadali z več dejavniki psihosocialnega tveganja in da so bili pod precejšnjim duševnim pritiskom, kar je povezano z večjo pojavnostjo težav z duševnim zdravjem. Rezultati poudarjajo potrebo po oblikovanju politik v visokošolskem izobraževanju, ki bodo osredotočene na zdravje, da se zmanjšajo izdatki za zdravstvo in poveča delovna učinkovitost.

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## 1 INTRODUCTION

The number of anxiety disorders and depression-related problems among employees is rising worldwide. Niedhammer et al. (1) measured health effects in 31 European countries by examining absence from work on grounds of sickness, where longer absence indicated a poorer health status. In the Hungarian sample, job insecurity was the highest risk factor for increasing the duration of absence. Slany et al. (2) studied the factors behind long-term absence on grounds of sickness in Europe, and found that quantitative job demands and the demand to conceal emotions, a lack of development opportunities, role conflicts, leadership problems, a lack of social support and sense of community, existing workplace physical violence, bullying and discrimination, shift work, and the difficulty of obtaining job promotion played the most decisive roles. Fransson et al. (3,4) verified the increasing likelihood of physical inactivity during leisure time associated with low job control and excessively high or low job demands. Kivimäki et al. (4) conducted a systematic review of the data and found that long working hours increased the risk of stroke. When studying almost 27,000 French respondents, Niedhammer et al. (5) found that low decisions-making autonomy, high demands, low support and reward, physical and verbal abuse, job insecurity and long working hours were all associated with depression and anxiety.

Pikhart and Pikhartova (6) have identified 37 PubMed and Medline research articles published since 2000 that confirm the association between psychosocial risk factors and cardiovascular and cancer morbidity and mortality in Europe. These factors included high job demands, low job autonomy, low control, high effort-reward imbalance, interpersonal conflicts, low social support, and low trust. The results of the Hungarian Mental State 2013 research study indicated a rise in workplace insecurity (women 23.6%, men 16.7%) compared to the results from the 2006 survey, as well as low collegial support among employees (7). Just over one third (33.6%) of employees over 50 were extremely overworked, and the number of those with low workplace control had doubled in six years (8). The extent of effort-reward imbalance among those with a higher education degree was multiplied by 1.5 (7). As a result of all these workplace characteristics, the chance of depression emerging among employees has increased (7). National and international research results underline that workplace stress causes mental and somatic problems (9-11). With the number of such problems increasing, prevention has become very important. Important elements of prevention include identifying the psychosocial risk factors and measuring their extent. Psychosocial risk factors are the totality of those factors (conflicts, organisation of work, working arrangements, insecurity of employment, etc.) that affect employees

at their workplace and influence individual responses to these effects. Their related consequences can be stress, work accidents and psychosomatic illnesses (12).

The main aim of the present study is to define exposure to workplace-related risk factors, with special focus on the psychosocial factors and their interconnections with:

1. workplace conditions;
2. relationships with superiors and colleagues;
3. moral, professional and financial appreciation.

## 2 METHODS

A cross-sectional study was carried out at the University of Szeged, Hungary, which is the biggest service provider of the Southern Great Plains Region. The university has 12 faculties, employs 8,600 academic and non-academic staff (including 2,225 academic research and teaching staff) and provides education to 21,000 students.

An online self-administered questionnaire was completed by staff at healthcare-oriented faculties (Faculty of Medicine, Faculty of Pharmacy, Faculty of Dentistry, Faculty of Health Sciences and Social Studies) and non-healthcare-oriented faculties (Faculty of Law and Political Sciences, Faculty of Humanities and Social Sciences, Faculty of Economics and Business Administration, Faculty of Engineering, Juhász Gyula Faculty of Education, Faculty of Agriculture, Faculty of Science and Informatics, and the Béla Bartók Faculty of Arts) at the University of Szeged. Those categorised as healthcare-oriented faculties performed healthcare-related activities, with curricula related to healthcare, while there was no such orientation in the other group of faculties. A short description of the study and a link to the online questionnaire were sent to teaching and non-teaching university staff. The questionnaire was completed by 261 employees (10% of the target population). The questionnaire asked for basic socio-demographic data (sex, age, marital status, level of education), as well as the characteristics of the employees' working conditions and work activities. The questionnaire was based on the Hungarian version of the European Health Interview Survey 2009, and the work condition characteristics were selected on that basis (13-15). The following factors were included: risk of infection, effects of heat, radiation, noise, etc., and psychosocial factors such as strict deadlines, frequent overwork, the difficulty in meeting requirements, intensity of work, communication problems, violent behaviour of colleagues, discrimination, bullying, independent decision-making, the possibility of using one's own knowledge and skills, a post requiring many autonomous ideas and inventiveness, and the possibility of job promotion.

A principle component analysis was applied to the 19 work environment factors in order to determine whether it was possible to characterise the work conditions of university staff with fewer variables. The Kaiser-Meyer-Olkin (KMO) criterion was applied to determine the suitability of the data for the principal component analysis. As the KMO was higher than 0.6, it was appropriate to perform a principal component analysis. The individual principle component values were calculated with the help of a regression method. The resulting scores have a mean of 0 and the variance equals the squared multiple correlation between the estimated factor scores and the true factor values. The principle components were further analysed by sex, as well as in terms of relationship with colleagues and superiors, and financial, moral and professional appreciation. As the principal components did not show a normal distribution in all cases according to the Kolmogorov-Smirnov test, we applied the Mann-Whitney U and the Kruskal-Wallis tests, with the Bonferroni correction for multiple tests for the latter in the case of a pairwise comparison. The results were considered to be significant at  $p < 0.05$ . Statistical analysis was performed using IBM SPSS 22.0.

The Regional and Institutional Human Medical Biological Research Ethics Committee of the Szent-Györgyi Albert Clinical Centre, University of Szeged, approved the study protocol (No 3132). Participation in the study was voluntary and anonymous.

### 3 RESULTS

#### 3.1 Socio-demographic characteristics of the sample

The research sample comprised 261 university employees. Women accounted for 67% of the complete sample, and the mean age was 43.4 years (Table 1). The youngest participant was 21 and the oldest was 72. More than two-thirds of the employees (69.8%) were married or lived in a partnership, and most of them had one or more higher education degrees (90.5%).

#### 3.2 Principle component analysis of working conditions

A principal component analysis (16) was performed through 19 variables to determine the working conditions the university staff worked under.

The terms of the principal component analysis were met: enough variables were used according to the KMO value (0.780), and the strength of the correlation between the variables was also sufficient according to the Bartlett-test ( $p < 0.001$ ). The Varimax method was applied for factor rotation. According to the results of the total defined variances, five principal components were obtained with an Eigen value higher than 1. These factors defined 60.737% of the total variance. Values with a low factor weight (less than 0.3 (0.4)) were ignored.

**Table 1.** Socio-demographic characteristics of the research sample.

Variables		n (%)
Sex	male	86 (33.0)
	female	175 (67.0)
Age groups (years)	20-29	23 (8.8)
	30-39	87 (33.3)
	40-49	76 (29.1)
	50-59	56 (21.5)
	60-	19 (7.3)
Marital status	married or partnership	182 (69.8)
	divorced	31 (11.9)
	single	45 (17.2)
	widowed	3 (1.1)
Level of education	secondary	25 (9.5)
	higher	236 (90.5)

Five principal components were identified during the analysis (Table 2). For the sake of comprehensibility, the individual principle components were named on the basis of variables with a high factor weight. The first principle component (five items) was “job demands” with an explained variance of 14.712; the second principle component (four items) was “autonomy” with an explained variance of 13.178; the third principle component (4 items) was “biological, chemical agents” with an explained variance of 12.148; the fourth principle component (three items) was “negative social interactions” with an explained variance of 10.908; and the fifth principle component (three items) was “physical agents” with an explained variance of 9.790. As the present paper focuses on an analysis of psychosocial components, the first, second and fourth principle components were studied as psychosocial characteristics. Job demands (Component 1) refer to the compilation of work condition characteristics such as strict deadlines, permanent stress, frequent overwork, difficulty in meeting requirements, intensity of work and communication problems. Work was called autonomous (Component 2) when the following work environment characteristics applied: the individual had the opportunity to make independent decisions and utilise their own knowledge and skills, the job required many autonomous ideas and inventiveness, and the individual had the possibility of job promotion. In the case of negative social interactions (Component 4), the following characteristic elements were identified: violent behaviour of colleagues, bullying, discrimination and fear of losing one’s job.

The internal validity of the individual principle components was checked by defining Cronbach’s alpha, which exceeded, in the case of each psychosocial principle component, the expected minimum of 0.7 (Table 2).

In terms of job demands, University of Szeged employees suffered from strict deadlines (80.4%), frequent overwork (64.2%), difficulty in meeting requirements (56.7%), communication problems (47.5%), and intensity of work (45.8%) (Table 2). The frequency of negative social interactions was over 10% (bullying 17.2%, discrimination 12.3%, violent behaviour of colleagues 11.5%). Work was also characterised by autonomy. Their work required many autonomous ideas and inventiveness (87.7%), they had the possibility of utilising their own knowledge and skills (84.7%), they could make independent decisions (80.8%), and they had the possibility of job promotion (56.5%).

When analysing responses by sex, significant differences were obtained only in the case of autonomy (Mann-Whitney U test:  $U=5989.500$ ;  $P=0.011$ ); independence, utilising own knowledge, possibility of job promotion characterised men more than women (Table 3).

**Table 2.** Work environment characteristics resulting from the principal component analysis; the incidence of individual components in the complete sample.

Variables	n (%)	Component loads	Defined variance	Cronbach's alpha
<b>Component 1: Job demands</b>			14.712	0.796
strict deadlines	80.4	0.777		
difficulty in meeting requirements	56.7	0.760		
frequent overwork	64.2	0.730		
intensity of work	45.8	0.675		
communication problems	47.5	0.612		
<b>Component 2: Autonomy</b>			13.178	0.757
possibility of independent decisions	80.8	0.846		
work requiring many autonomous ideas and inventiveness	87.7	0.819		
possibility of utilising own knowledge and skills	84.7	0.707		
possibility of job promotion	56.5	0.600		
<b>Component 3: Biological, chemical agents</b>			12.148	0.622
accident risks	22.6	0.760		
infection risks	34.2	0.749		
lifting heavy objects, uncomfortable posture	12.6	0.731		
chemicals, dust, gas, smoke, steam	27.6	0.615		
<b>Component 4: Negative social interactions</b>			10.908	0.739
violent behaviour of colleagues	11.5	0.823		
discrimination	12.3	0.806		
bullying	17.2	0.710		
<b>Component 5: Physical agents</b>			9.790	0.590
effects of heat	9.2	0.859		
effects of radiation	13.4	0.720		
noise, vibration	37.9	0.548		

**Table 3.** Psychosocial principle components (1, 2, 4) by sex.

Variables	Sex		P-value*
	Male	Female	
	Mean rank	Mean rank	
Job demands (1)	141.69	125.07	0.095
Autonomy (2)	147.54	122.23	0.011
Negative social interactions (4)	120.89	135.17	0.151

\*Results of Mann-Whitney U test

Autonomy was less characteristic in the case of conflicts with colleagues, though this result was on the verge of significance ( $p=0.052$ ), and negative social reactions were more frequent ( $p<0.001$ ), while the job demands component had no significant association with relationship with colleagues (Table 4). The more conflicts there were with an employee's superior, the more negative social interactions were reported ( $p=0.004$ ), and less autonomy was characteristic ( $p=0.002$ ) (Table 4).

Financial, professional and moral appreciation had significant relationships with all three psychosocial principal components: in the case of low (practically no) financial, professional and moral appreciation, the job demands component (frequent overwork, strict

deadlines, etc.) was more characteristic, and there were more frequent negative social reactions, as well as less autonomy. According to the results of the pairwise comparison, the difference was always significant between the "yes" and "no" answers, and mostly significant between the "yes" and "partly" answers (Table 4).

#### 4 DISCUSSION

The depressive state is considered to be the most stressful and has led to a deterioration in ability to work in Hungary (8). The results of the European Health Interview Survey 2014 showed that 4% of the Hungarian population were affected by chronic depression (17). In

**Table 4.** The association between psychosocial principal components (1, 2, 4) and relationships at and the satisfaction with work.

Variables	n (%)	Job demands (1)		Autonomy (2)		Negative social interactions (4)	
		Mean rank	P-value*	Mean rank	P-value*	Mean rank	P-value*
<b>Relationship to colleagues</b>			0.099		0.052		0.000 <sup>1</sup>
A) Harmonious, they can work well together.	91 (34.9)	121.37		139.01		118.70	
B) They usually get along well with each other.	141 (54.4)	130.62		132.08		128.18	
C) There are greater or lesser disputes.	24 (9.2)	164.56		97.81		169.60	
D) Conflicts, with frequent disputes.	4 (1.5)	129.75		77.50		246.00	
<b>Relationship to superiors</b>			0.018		0.002 <sup>2</sup>		0.004 <sup>3</sup>
A) Harmonious, they can work well together.	102 (39.1)	114.47		149.12		124.97	
B) They usually get along well with each other.	119 (46.0)	135.51		121.59		123.30	
C) There are greater or lesser disputes.	27 (10.3)	155.98		124.61		153.50	
D) Conflicts, with frequent disputes.	12 (4.6)	159.75		73.83		197.17	
<b>Financial appreciation</b>			0.005 <sup>4</sup>		0.001 <sup>5</sup>		0.022 <sup>6</sup>
A) yes	58 (22.2)	106.87		149.96		112.27	
B) partly	123 (47.5)	129.61		137.09		128.04	
C) no	79 (30.3)	149.24		105.96		147.71	
<b>Professional appreciation</b>			0.000 <sup>7</sup>		0.000 <sup>8</sup>		0.061
A) yes	119 (46.0)	109.04		156.97		125.28	
B) partly	108 (41.4)	149.61		114.62		127.44	
C) no	33 (12.6)	145.33		87.03		159.33	
<b>Moral appreciation</b>			0.000 <sup>9</sup>		0.001 <sup>10</sup>		0.000 <sup>11</sup>
A) yes	145 (55.9)	113.63		143.69		118.02	
B) partly	86 (33.0)	148.37		122.76		131.62	
C) no	29 (11.1)	161.83		87.52		189.59	

\*Results of Kruskal-Wallis test; Bonferroni correction for multiple tests.

<sup>1</sup> Significant results of post hoc testing (p-value): A and D (0.006); B and D (0.012); A and C (0.019)

<sup>2</sup> Significant results of post hoc testing (p-value): A and D (0.006); A and B (0.040)

<sup>3</sup> Significant results of post hoc testing (p-value): A and D (0.010); B and D (0.007)

<sup>4</sup> Significant results of post hoc testing (p-value): A and C (0.003)

<sup>5</sup> Significant results of post hoc testing (p-value): A and C (0.002); C and B (0.012)

<sup>6</sup> Significant results of post hoc testing (p-value): A and C (0.019)

<sup>7</sup> Significant results of post hoc testing (p-value): A and C (0.043); A and B (0.000)

<sup>8</sup> Significant results of post hoc testing (p-value): A and C (0.000); A and B (0.000)

<sup>9</sup> Significant results of post hoc testing (p-value): A and B (0.002); A and C (0.005)

<sup>10</sup> Significant results of post hoc testing (p-value): A and C (0.001)

<sup>11</sup> Significant results of post hoc testing (p-value): A and C (0.000); B and C (0.001)



the background of the depressive state observable among the lowest socioeconomic status (SES) adult population, the perception of their conditions is also considerable as one of the risk factors affecting health in the Hungarian population (18). Jørgensen et al. (19) pointed out that a good working environment was needed for effective health promotion at the workplace. Individuals' participation in workplace health promotion was affected by structural (quantitative and physical demands, organisation of work) and interpersonal (social support by colleagues and supervisors) factors. Dutch focus-group research among university staff showed that demands by the university, their own high working standards and the fear of having less time for research led to huge mental stress (20). Corresponding to the literature, in our study the primary workplace stress factors experienced by employees were strict deadlines (80.4%), frequent overwork (64.2%) and difficulty in meeting requirements (56.7%). There are differences if we compare our results to the Hungarian data from the European Health Interview Survey 2009, when strict deadlines occurred only in only 48.5% of cases, frequent overwork in 45% of cases and difficulty in meeting requirements in 32.7% of cases. The European Health Interview Survey revealed fewer problems than did the Hungarian data (47.5% vs. 15%) (13). There were no significant differences by sex in the individual characterising psychosocial risk factors. This is similar to the results obtained in the 2009 Population Health Survey (13).

A principle component analysis was applied for the 19 work environment characterising factors used in the present research, with five principal components being identified during the analysis: 1) job demands, 2) autonomy, 3) biological, chemical agents, 4) negative social interactions, 5) physical agents. Of these, the first, second and fourth principle components were studied as psychosocial characteristics. The work of men was more characterised by autonomy (possibility of making independent decisions, utilising own knowledge and skills, job promotion, etc.). In the European Health Interview Survey 2009, autonomy was more characteristic among Hungarian men (13). Theorell et al. (21) also reported much higher job stress among women than men.

With an increase in the level of qualification came an increase in the possibility of job promotion and of frequent overwork. The latter connection was revealed by the 2013 survey performed among the adult population in Hungary (7). As the respondents of the present research were mostly highly qualified, it was not surprising that they experienced similar psychosocial risks in terms of autonomy. Similar results were obtained by Ziemska et al. (22) concerning their staff survey at the Medical University of Poznan: exposure to psychosocial factors and their negative impact on health was most evident among highly qualified employees.

Conflicts with university colleagues and/or superiors also occurred. Those who considered that their workplace relationships featured conflict or were problematic experienced external aggression and anxiety (bullying, violent behaviour of colleagues, discrimination) more often. Conflicts with superiors was often accompanied by workplace requirements that were hard to meet (frequent overwork, strict deadlines, requirements difficult to meet) and less autonomy. When analysing international studies published between 1990 and 2013, Theorell et al. (21) concluded that conflicts with superiors and colleagues facilitated the appearance of depressive symptoms. It is important to emphasise this fact as the Hungarian population is prone to depression (7), which can be further intensified by workplace conflicts.

With regard to low financial, professional, and moral appreciation, employees were characterised by the existence of work requirements impossible to meet, as well as by low autonomy. The experience of anxiety and aggression came with low financial and moral appreciation. Bradler et al. (23) conducted a field experiment to reveal that appreciation increased employees' performance. It is therefore possible to say that a lack of appreciation decreases effectiveness and has a negative effect on well-being at the workplace.

The main strength of the present study is the comprehensive measurement of working conditions in a higher education setting, with a special focus on the psychosocial risk factors highlighted in the paper. As the 1993 XCIII Law on Safety at Work provides that a Hungarian employer is obliged to take measures towards minimising psychosocial risk factors and the resulting damage to employee health (12), the present study could evolve into a model applicable in other university settings. The limitations are its cross-sectional nature, the low response rate of the university staff (and, consequently, the low representation of staff without a higher education degree), and the subjective estimation of one's working conditions, which could be different from the objective status. Future research in the field should reach a higher number of participants and members of each staff category (teaching and non-teaching staff).

## 5 CONCLUSIONS

Our data suggests that employees at the University of Szeged are subject to several psychosocial risk factors and work under considerable mental stress. Any decrease in this stress would lead to more effective and efficient work, preserve health and prevent illness.

One solution can be the increase in the feeling of financial and moral appreciation, and to create a more optimal working atmosphere. Through a "favourable"

work environment work safety and health protection can be improved. There is a need for a workplace health and safety policy and directive that considers workers' reflections, that checks the existence and extent of risk factors frequently. It is also needed to hire mental health promoters and psychologists to handle psychosocial risk factors. Our present research is suitable to base intervention suggestions on its results, the effects of which can be further studied, analysed, and refined. In the long run, a health-promoting leadership approach would be beneficial not only for those working at the university, but also for all employees in society, as their health promotion would result in reduced healthcare expenditure. Besides the existing legal regulations, their realisation in practice should also be monitored and actions to be taken when needed, if the necessary conditions are not thoroughly ensured.

#### CONFLICT OF INTERESTS

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#### ETHICAL APPROVAL

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000.

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