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Health and health influencing factors among staff and students of University of Szeged

PhD Thesis

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Publications related to the Thesis

I. **Mátó, V.**, Tarkó, K., Tóth, K., Nagymajtényi, L. & Paulik, E. (2016). Working Environment of Higher Education Staff – a Survey at University of Szeged, Hungary. *Central European Journal of Occupational and Environmental Medicine,* 22(1-2), 44-52. **ISSN:** 1219-1221

II. **Mátó, V.**, Tarkó, K., Tóth, K., Nagymajtényi, L. & Paulik, E. (2016). Health Behaviour of Higher Education Employees – Value-Transmitting Conduct of Professionals to their Students. *Practice and Theory in Systems of Education,* 11(3), 162-173. DOI 10.1515/ptse-2016-0017

III. **Mátó, V.**, Tarkó, K., Lippai, L., Nagymajtényi, L. & Paulik, E. (2021). Psychosocial work environment risk factors among university employees – a cross-sectional study in Hungary. *ZDRAVSTVENO VARSTVO Slovenian Journal of Public Health,* 60(1), 10-16. DOI 10.2478/sjph-2021-0003
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List of citable abstracts related to the Thesis

1. **Mátó, V.** (2013). Health status and lifestyle among the staff of Juhász Gyula Faculty of Education, University of Szeged. In: Benkő, Zs., Tarkó, K. & Lippai, L. (editors). *Leisure, Health and Wellbeing. Holistic Leisure and Health:* Mid-term Conference of International Sociological Association, Research Committee on Sociology of Leisure (RC 13) Szeged, Magyarország 2013.09.18. - 2013.09.20. SZTE JGYPK Alkalmazott Egészségtudományi és Egészségfejlesztési Intézet, 70. **ISBN**: 978-963-9927-66-7
2. **Mátó, V.** (2014). A Szegedi Tudományegyetem dolgozóinak egészségi állapota és életmódja In: Torgyik, J. (szerk.). *II. Neveléstudományi és Szakmódszertani*

Konferencia Nové Zámky (Érsekújvár), 2014. január 9-11. International Research Institute s.r.o., Komárno. 69. **ISBN**: 978-80-89691-04-3

3. **Mátó, V**., Paulik, E., Molnár, R. & Nagymajtényi, L. (2015). The working environment for health science and non-health science faculties at the University of Szeged. In: Paulik, E. (ed.). *17th DKMT Euroregional Conference on Environment and Health.* Department of Public Health, Faculty of Medicine, University of Szeged, Szeged. 60. **ISBN:** 978-963-306-374-3
4. **Mátó, V.** (2021). A védőoltásokkal kapcsolatos attitűd vizsgálata egyetemi hallgatók körében. Népegészségügyi Képző- és Kutatóhelyek Országos Egyesületének XIV. Konferenciája, Szeged. *Népegészségügy*, 98(2), 271. **ISSN**: 0369-3805

List of abbreviations

AOR	adjusted odds ratios
BSc	Bachelor of Science
CI	confidence intervals
COVID-19	coronavirus disease 2019
EHIS	European Health Interview Survey
OR	odds ratio
ENWHP	European Network for Workplace Health Promotion
KMO	Kaiser-Meyer-Olkin
MSc	Master of Science
SAGE	Strategic Advisory Group of Experts
SES	socio-economic status
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization
WHP	Workplace Health Promotion

1. Introduction

Educational institutions transmit a set of values to their students, and the health behavior and attitudes of those working there can be a determining factor for the next generation in relation to healthy lifestyles (McGuire & Phye, 2006).

Higher education institutions provide a specific physical and social environment for their students and staff. It can also be important to know the health status and lifestyle of employees in these organisations, and to implement health promotion and health protection initiatives in the light of these data – supporting the interests of the institution – in order to increase productivity, in addition to having an impact on students (Lippai & Benkő, 2005).

As adults, we spend a significant part of our time at work, no matter what the environment is, whether there is a risk of harm in the workplace environment, and if so, to what extent.

Since 2015 the International Health Promoting Universities & Colleges Network is guided by the Okanagan Charter. The Charter states that health is central to the policies of the network's member institutions, that the institutional environment and culture are supportive and that personal development is ensured. It places health, well-being and sustainability, and health promotion knowledge at the heart of health promotion actions. It stresses the important role of relationships and collaborations within and outside the institution in order to make the knowledge acquired applicable at local and global level for health promotion (Okanagen Charta, 2015).

In higher education institutions, shaping the health consciousness of students is important because they will be the new generation of intellectuals who will pass on the knowledge that will help shape the health consciousness of future generations in a positive direction. It is essential that the working conditions in training institutions are such that they strive to create the right healthy situation or an aspired one; this means, in part, a learning pattern from a practical point of view.

1.1. Theoretical background

1.1.1. Settings of health promotion

Since the Ottawa Charter for Health Promotion (1986) has been issued it is well known that „Health is created and lived by people within the settings of their everyday life; where they learn, work, play and love." The notion of settings evoked the idea of taking the sole responsibility for health off the individual and examine those places and contexts as well where people live their lives (Whitelaw, et al., 2001; Dooris & Doherty, 2010). The Health Promotion Glossary (1998) defines the settings for health as „The place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and well-being." Accordingly, if health promotion wants to be effective, it should focus on the settings of daily activities (Dooris, et al., 2014), like home, workplace, community spheres etc.

In adulthood, the workplace is an excellent setting for health promotion. Since 1996, The European Network for Workplace Health Promotion (ENWHP) has been working to promote and improve the health and well-being of workers (European Network for Workplace Health Promotion, 2017); Hungary has also joined this organisation. The network has defined the concept of workplace health promotion: "Workplace Health Promotion (WHP) is the combined efforts of employers, employees and society to improve the health and well-being of people at work." The prerequisite of the effectiveness of health promotion in the workplace: "improving the work organisation and the working environment; promoting active participation; encouraging personal development" (European Network for Workplace Health Promotion, 2007, 2.). Employers can support the preservation, maintenance or promotion of the health of their employees in a variety of ways: health promotion programmes, wellness opportunities, initiatives and events focusing on the employee's internal resources. Maintaining a healthy and safe working environment, with particular emphasis on a healthy psychosocial working environment, is a prerequisite for all of this to be effective (Dankó, et al., 2022). For example, if work relationships and work activities are characterised by stress, the employee is less likely to value those opportunities offered by their supervisor, which also support their health and well-being (Jenkins, et al., 2022). The effectiveness of a workplace health promotion programme does not depend on the cost of the event, but rather on the competence of the person who runs the event. A lower cost programme can be just as attractive and useful to employees as a higher cost event, if the right person is involved in its implementation (Street & Lacey, 2018).

A university can also be a setting for workplace health promotion. A university is a complex system, not only in terms of size (student and staff numbers) and operation, but also because of the heterogeneity of staff in terms of skills and activities.

For those employed by a university, this is the „context within which particular people (students, staff) live aspects of their daily lives and with which others (families, external services, wider community) interact" (Dooris, et al., 2014, 11.). This important place of teaching, learning and research needs healthy, satisfied and motivated employees to be able to provide high quality services for the society. Satisfaction and motivation are prerequisites of feeling healthy. Feeling of satisfaction is influenced positively or negatively by organisational climate factors, co-worker relationships (Cohen & Wills, 1985; Thomsen, et al., 1999; Mizuno, et al., 2006), working conditions, organisational commitment and leadership, and management (Birbirsa, et al., 2015).

1.1.2. Work environment as a health influencing factor

The number of anxiety disorders and depression-related problems among employees is rising worldwide. Niedhammer et al. (2013) 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. (2014) 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. A systematic review of 56 studies have shown the impact of organisational climate on workers' health (Loh, et al., 2019). Fransson et al. (2012) and Kivimäki et al. (2015) 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. (2015) 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. (2015) 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 (2015) 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 Hungarostudy 2013 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 (Salavecz, 2013). 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 (Kopp & Skrabski, 2000). The extent of effort-reward imbalance among those with a higher education degree was multiplied by 1.5 (Salavecz, 2013). As a result of all these workplace characteristics, the chance of depression emerging among employees has increased (Salavecz, 2013).

National and international research results underline that workplace stress causes mental and somatic problems (Racic, et al., 2017; Dobnik, et al., 2018; Cecho, et al., 2019). With the increasing number of such problems, 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 (Rights and responsibilities of employers and employees in creating safe and healthy work environment (1993) XCIII. Law on Safety at Work, Chapter IV., 1993).

The results of a Polish study show that positive interactions and a climate of mutual trust among employees are essential, as they contribute positively to the level of job satisfaction (Bulińska-Stangrecka & Bagieńska, 2021). If communication, concentration, ergonomically appropriate furniture, good air quality or the presence of plants in the worker's environment are ensured, job satisfaction will also be apparent (Voordt, 2023).

The physical office work environment affects employee well-being (Kazlauskaitė, 2023), performance (Seddigh, et al., 2015; Ngcobo & Mhlanga, 2022), and satisfaction with the organisational culture (Zerella, et al., 2017). Larger single-space offices (Voordt, 2023), shared office space, and more background noise have negative effects on employee health (Colenberg, 2021), cognitive performance (Seddigh, et al., 2015; Mueller, et al., 2022) and job satisfaction (De Croon, et al., 2005). The location of an office, its position within a building, its equipment and its layout influence the way in which an employee perceives the environmental factors of

the office. This is why it is important to know the advantages and disadvantages before making design decisions. Employees under the age of 46 who used closed offices at Gazi University of Technology (Turkey) rated the physical environment of the office more favourably than those over 46 (Yildirim, et al., 2022). The age of the employee also affects how an individual assesses the environmental factors in an office. Administrative staff at a multi-campus public university in South Africa consider a comfortable physical environment important to improve performance (Ngcobo & Mhlanga, 2022). There is a decline in work performance due to health and/or work environment problems. According to the research of Lohela-Karlsson et al. (2022), carried out in a sample of 1,475 individuals, the decline can be reduced if the individual has sufficient work motivation, job commitment and job satisfaction.

1.1.3. Factors characterising the health status of higher education employees

Workplaces and employees' health are closely connected. A healthy workforce would increase productivity, effectivity and efficiency which will benefit the employer in financial and moral terms as well. On the contrary, if employees experience stress, long working hours, bad managerial style, not safe working conditions, that would lead to ill physical and mental health and poor lifestyle habits like lack of exercises, smoking, drinking and inadequate diets (Sparks, et al., 2001).

Less absenteeism due to illness among employees characterises a healthy workplace (Voordt, 2023). For example, allowing flexibility in the place and time of work can help to protect workers' health (Shifrin & Michel, 2022). Creating and maintaining a better work environment leads to better performance among employees (Hafeez, et al., 2019).

We can find different health behaviour patterns along socio-economic status (SES) differences. This effect is proven, among others, in case of leisure time physical activity (Lindström, et al., 2001). Lindström et al. (2001) based their measure of SES on job title, tasks and position at work. In their studies, higher SES people were hindered from exercising by internal barriers (lack of motivation and leisure time) rather than by lack of money or existing disability reported by lower SES people. Linder (2009) researched the exercising behaviour of higher education employees. Employees reported on the mental, emotional appearance and weight management benefits of exercising, while they experienced the disadvantages of lack of time and employer support, lack of health education, and home duties. The type of exercise higher education employees engaged in the most was walking.

The above differences might be due to differences in social capital, which according to Bourdieu's theory (1986) is also an indicator of the population's SES. High levels of social capital measured in dimensions like social support, social networks and participation is strongly associated with all components of health and health behaviour (Nieminen, 2015). Social participation is indicated by the number of social groups we belong to; social support is provided by all those people and groups we can rely on when we need help; social networks can promote our self-esteem and provide relief in stressful situations. According to Antonovsky's theory on the sense of coherence (Nieminen, 2015) our social capital serves as a general resistance resource facilitating effective coping. Social capital and level of education go hand in hand. Ross and Wu (1995) stated, that education has a direct effect on health as well as indirect effects "*through work and economic conditions, social-psychological resources and healthy lifestyle*" (Ross & Wu, 1995, 719.). The well-educated tend to have greater control over their lifestyle, like less smoking and drinking, more exercising, more health check-ups. Li and Powdthavee (2015) though say that education does not necessarily lead to the avoidance of smoking, drinking and engaging in more preventive health checks.

Kulhánová et al. (2014) conducted a study involving 21 European countries and showed that higher educational attainment leads to favourable trends in mortality, though the strength of this effect varies by countries. The effect of education on mortality was maximal in case of Hungarians. Therefore, the increased level of education is a possible strategy to improve population health.

Kouvonen et al. (2005) found clear evidence for the association between work stress and smoking, regardless of age, level of education, occupational status, marital status or type of employment. The higher the work stress is, the higher the smoking intensity becomes. Fichtenberg and Glantz (2006) suggest that workplaces should be smoke-free, as evidence shows smoke-free workplaces help smokers quit smoking as well as prevent non-smokers from the dangers of passive smoking. In Hungary, partly as a result of the amendment of Act XLII of 1999 on the Protection of Non-Smokers, Act XLI of 2011 states that smoking is prohibited in enclosed workplaces, with the exceptions set out in the Act (Act XLI of 2011 amending Act XLII of 1999 on the Protection of Non-Smokers and Certain Rules on the Consumption and Distribution of Tobacco Products, 2011).

University as a workplace has all the prerequisites that can be utilized to become an effective intervention site: peer networks, time spent together with fellow workers (Hutchinson & Wilson, 2011), supporting academic environment, high level of education,

knowledge and motivation. It is worth studying how a workplace like this affects its employees' health and health behaviour (Mátó, et al., 2015).

Beside the undoubted benefit of regular wages, successful work, positive evaluation, social support of colleagues and superiors increase self-efficacy and sense of control, which in turn promote our health (Stansfeld, et al., 1998; Naidoo & Wills, 1999). Feeling of support leads to job satisfaction and helps to create a positive work-related self. However, those working in higher education sometimes need to face several challenges, like decreased funding, worse working conditions, changing professional requirements, less influence and less involvement in decision-making processes (Clarke, et al., 2015) or uncertain employment (Karasek, 1989). Working condition is characterised by more students with higher skill differences and special needs, longer working hours, more administrative workload and less opportunities for research, a pressure of raising extra funds and 'publish or perish' as well as a lack of collegiality and promoting social networks (Clarke, et al., 2015). All these factors can raise employees' level of stress which in turn might cause psychiatric problems, coronary heart disease, musculoskeletal problems and symptoms associated with gastrointestinal disorders, as well as have consequences regarding job performance and safety. Long working hours lead to fatigue and consequently risky behaviour and longer exposure to physical, chemical and other hazards (Spurgeon, et al., 1997; Andrea, et al., 2003).

We can also state that higher education employees' health and health behaviour are also closely connected to their 'clients' health. As an educational setting, higher education has the social commitment of creating a sense of responsibility towards health, a capacity to act and a health-conscious behaviour among students. "…healthconscious persons are characterized as actively incorporating healthy behaviours in their daily routines, consistently being attentive to their health conditions, actively seeking and using health information from diverse sources, taking responsibility for their health, and being motivated to stay healthy" (Hong, 2009, 7.). Gardner (2015) argues that automatization is a key element for making health behaviour a habit pervading our everyday activities. Educators in higher education, with their preferably automatized healthconscious behaviour, could be the sources of setting examples for the growing generations (Lumpkin, 2008), and they could be role models through respect, admiration and imitation (Paice, et al., 2005). Role-models could be those individuals whose behaviour is an example or a model for others, who want to learn these (Filstad, et al., 2007). Certain professional values, attitudes, forms of behaviour (Paice, et al., 2005), success in sciences and professional career (Perry & Nixon, 2005) can also be examples. This way the

health status and lifestyle of higher education professionals affect university students, hence they influence their students' health behaviour through their behaviour, habits and customs.

By emphasising health promotion in their approach and practice, higher education institutions can contribute not only to protecting, maintaining or improving the health of their staff and students, but also to protecting the health of the wider community, the population (Tsouros, et al., 1998). A university or college becomes a prominent setting for health promotion if its mission statement includes health-promoting values and principles (Okanagen Charter, 2015).

As stated above, the knowledge acquired during higher education is essential because it partly influences the own health of this population and, in addition, it must be transferred to the population, as has been mentioned earlier. Results from Hungarian national studies also confirm the importance of higher education in health protection. The highest educational attainment is the most important determinant of health status alongside financial status, with the likelihood of long-term illness(es) being lower among those with higher educational attainment and better wealth (Győri, 2022). Health status is better by increasing the level of education (Lampek, 2004), those with a diploma perceive their health status as better (Hungarian Central Statistical Office, 2021c).

The nutritional habits of Hungarian university students need to change (e.g. low daily consumption of fruit and vegetables, below 50% (Bencsik, et al., 2018; Masa & Tobak, 2022)), physical inactivity, idleness and online presence are common among them (Bencsik, et al., 2018).

The health behaviour and attitudes of medical students are particularly important because they serve as an example to the general population and patients. The results of a study of health science students show that their lifestyle needs change and that the increase in knowledge does not lead to an improvement in their health behaviour, so they are less able to have an indirect positive impact on the people they care for and on these people's lifestyle (Masa & Tobak, 2022).

They also indicated that having a higher education qualification does not in itself protect against some of the problems associated with this type of work.

It is also essential that the future intelligentsia live according to their knowledge at the age when they are students, and do not have any harmful habits, such as alcohol, drugs or smoking. Students in higher education who regularly smoke, consume more alcohol or drugs are more likely to be absent from classes, fail one or more exams, increasing the likelihood of dropping out (Kovács & Müller, 2019).

2. Aims

The main aim of the study was to survey the health influencing factors focusing on health behaviour and working envirenment among university staff (Study 1) and students (Study 2) in order to support the development of the health promoting program of the University of Szeged.

To complete the main aim, the followings were in the focus of Study 1 among the employees of the University of Szeged:

- to analyse the health promoting and damaging behaviour including nutrition, smoking, alcohol consumption, physical activity, leisure time activity;
- to characterize their participation in screening programs;
- to analyse the association between the satisfaction with their own fitness, health and looks with the importance of health and with their self-categorised health status;
- to explore the working conditions of the staff of the University;
- to define exposure to workplace-related risk factors, with special focus on the psychosocial factors and their interconnections with
    - workplace conditions;
    - relationships with superiors and colleagues;
    - moral, professional and financial appreciation.

To complete the main aim, the followings were in the focus of Study 2 among the students of the University of Szeged:

- to analyse the health promoting and damaging behaviour including nutrition, smoking, alcohol consumption, physical activity;
- to measure the students' ideas about their own possibilities in the promotion and prevention of their own health;
- to characterize their attitude toward vaccination as an important tool of prevention; the increasing level of vaccine hesitancy during COVID-19-pandemic called the attention for the role healthcare staff, including medical students as future physcians in the motivation of people to be vaccinated against infectious diseases.

3. Materials and methods

3.1. Study of university staff (Study 1)

3.1.1. Study design and participants

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 had 12 faculties, employs 8,600 academic and non-academic staff (including 2,588 academic research and teaching staff) and provided education to 20,000 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, Gyula Juhász 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 the teaching and non-teaching university staff. The questionnaire was completed by 261 employees (10% of the target population).

The Regional and Institutional Human Medical Biological Research Ethics Committee of the Albert Szent-Györgyi Clinical Centre, University of Szeged approved the study protocol (No. 175/2012). Participation at the research was voluntary and anonymous.

3.1.2. Questionnaire

The questionnaire asked for basic socio-demographic data (sex, age, marital status, level of education), characteristics of the employees' working conditions and work activities, employees' lifestyle, such as nutritional habits (food frequency), physical activity (exercise and sport), leisure time habits, smoking and alcohol consumption, and visiting the doctor. Based on the reported level of education, the data were classified into secondary and tertiary education categories. The secondary education category covers the levels of vocational education, vocational secondary and technical education, and academic seondary education. Tertiary education was defined as higher vocational education, college (BSc), university (MSc) level studies. From the point of health status, self-reported health and chronic diseases were asked.

The questionnaire was based on the Hungarian version of the European Health Interview Survey 2009. The following working condition characteristics 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. basis (Tokaji, 2011; European Agency for Safety and Health at Work, 2012; Kristensen, et al., 2005).

10-points Likert scales were used to measure the extent of physical and mental stress at work (1=not stressful; 10=very stressful), the working atmosphere (1=very bad, 10=very good), and the extent of satisfaction with actions to preserve and promote employees' health (1=not satisfied at all, 10=completely satisfied).

The promotion and protection of the employees' own health was measured on a 10-points Likert scale, too (where 10 meant 'very important').

3.1.3. Statistical analysis

Statistical analysis was performed using IBM SPSS 22.0 and 26.0 versions.

Descriptive and analytical statistics were applied (frequencies, means±SD, cross tabulation analysis with chi-square test, one-way ANOVA, Spearman and Pearson correlations, t-test).

A principal component analysis (Burstyn, 2004) 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 principal 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 principal 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.

In all analyses the results were considered to be significant at $p<0.05$.

3.2. Study of university students (Study 2)

3.2.1. Study design and participants

The cross-sectional study was conducted among first and fourth year medical students of the University, using an online questionnaire. The data was collected using an online questionnaire, and the link to the questionnaire was sent to the students electronically [official university course forum message (CooSpace) or by entering a QR code].

The Regional and Institutional Human Medical Biological Research Ethics Committee of the Albert Szent-Györgyi Clinical Centre, University of Szeged approved the study protocol (No. 5018). Participation at the research was voluntary and anonymous.

3.2.2. Questionnaire

The questionnaire examined sociodemographic characteristics (age, sex), lifestyle related factors (nutritional habits – fruit and vegetable consumption; smoking; alcohol consumption; physical activity) and students' vaccination related knowledge and attitude. The lifestyle related questions were based on the Hungarian version of the European Health Interview Survey 2019 (EHIS 2019). From the point of the vaccination, we examined the administration of influenza and COVID-19 vaccinations among students, the self-assessment of knowledge about vaccinations, the importance of vaccinations, and student opinions about recommended vaccinations.

Vaccine hesitancy or acceptance was defined using the WHO SAGE definition (vaccine hesitancy is a "delay in acceptance or refusal of vaccines despite availability of vaccination services) (Kun, et al., 2019; McDonald & the SAGE Working Group on Vaccine Hesitancy, 2015). We looked at the responses to the question "Have you received the COVID-19 vaccine as a student?" to see who had requested vaccination before it became mandatory (vaccine acceptance) and who had not been vaccinated until after it became mandatory or even then (vaccine hesitancy) (Paulik, et al., 2023).

Given that many vaccinations are mandatory in Hungary, vaccination attitudes towards recommended vaccinations were investigated using questions from a pilot study among students of the Gyula Juhász Faculty of Pedagogical Education at the University of Szeged (Mátó, 2022). Students rated 18 statements on a scale up to 1–4 (e.g. "If my general practitioner recommends a vaccination, I will administer the vaccination") on the extent to which the

statement is typical for them (1=not typical at all; 4=very typical). For the analyses, the responses from 1–2 (hereafter "not typical") and 3–4 (hereafter "typical") were merged.

3.2.3. Statistical analysis

Data were analysed using IBM SPSS 28.0.

Data were evaluated by descriptive and analytical statistical methods according to sex and academic year group. Groups were compared using percentage distributions and chi-square test. Multivariable logistic regression analyses were applied to reveal the associations between vaccination related attitude and vaccine hesitancy or acceptance adjusted for sex and academic year group. Goodness of fit of the model was tested using the Hosmer-Lemeshow test. The results are presented as adjusted odds ratios (AOR) and 95% confidence intervals (CI); the level of significance was $p<0.05$.

4. Results

4.1. Study of university staff (Study 1)

4.1.1. Socio-demographic characteristics of the sample

The research sample comprised 261 university employees, from 11 faculties out of the 12 ones at the University of Szeged. 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. 47.9% of the answerers had a college or university degree, 40.6% had a PhD, and 5 people (1.9%) were doctors of Academy (DSc). Own financial status was characterised as good (18.0%) or very good (3.4%) by one-fifth of the respondents, 50.2% considered it to be satisfactory, 24.1% found it bad, and 4.2% thought it was very bad.

The respondents lived mainly in County Csongrád-Csanád (95.0%), where the University is located. The rest lived in the immediately adjacent Bács-Kiskun (1.5%), Békés (0.8%) and Jász-Nagykun-Szolnok (0.4%), or in the further afield Pest (2.3%) counties. Szeged was their permanent residence in 74.7%, 13.8% commuted daily between their home and workplace, while 11.5% had Szeged as their temporary place of residence. Participants lived mainly in family houses (37.2%) or in apartment houses (42.9%). 54.4% had one or two children, 15.3% had three or more children, while 30.3% had no children.

Table 1 *Socio-demographic characteristics of the research sample (N=261)*

Variables		**n (%)**
Sex	men	86 (33.0)
	women	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)

4.1.2. Health behaviour

Nutrition

It is preferential that most of the employees ate at least three times a day *(Table 2)*. The ideal frequency of eating five times a day was very rare. They ate snacks rarely (47.9%) or several times a week (32.3%), but there were also some employees snacking every day (13.8%).

Table 2 *Employees' eating frequency (%, N=261)*

Eating	**Daily**	**Several times a week**	**Rarely**	**Never**
Breakfast	79.3	7.4	12.4	0.9
Brunch	19.4	17.1	36.4	27.2
Lunch	74.7	17.5	6.9	0.9
Afternoon snack	12.4	19.8	42.4	25.3
Dinner	82.0	12.9	4.1	0.9
Snacking when not hungry	13.8	32.3	47.9	6.0

Apart from eating frequency the content of meals is also important. When studying the frequency of eating food with carbohydrate content we found that the answerers preferred white bread, though brown bread was also present in their nutrition at least couple of times a week. It

is unfortunate that only a trifling proportion of the staff members ate raw vegetables (11.1%) and raw fruits (18.9%) several times a day. Milk with different fat content was consumed daily or several times a day only by 40.1% of the answerers. Respondents preferred lean pork meat and skinless chicken meat to more greasy kinds of meat, and light cold meat to their fattier versions. Respondents cooked primarily with sunflower oil (63%), 22.7% used olive- or canola oil. 5.6% chose coconut fat or oil, 7.4% preferred animal fat, while only a few cases were reported when they cooked with margarine and butter. Part of healthy nutrition in adulthood is to prepare and eat meals with less salt, and try to savour it with seasons. More than the half of respondents (61.8%) used salt only when cooking, while 32.7% preferred less salty or unsalted food, meal. Only a low percent of respondents (5.5%) ate salty or put extra salt into the ready meal. Most of the respondents did not choose an alternative form of nutrition (93.1%). There were some semi-vegetarians (2.8%) and some applying reform nutrition (2.3%). Only 6.9% of respondents followed a fashionable diet for losing weight. 12 of them (80.0%) ate vitamin and mineral products regularly. When studying the whole sample, 64.5% consumed vitamin and/or mineral products regularly. Those who ate these products chose primarily combined vitamin and mineral products (40.1%), and only vitamin products on the second place (21.2%).

It is a positive result that drinking tap water and mineral water several times a day or daily was the most preferred way of hydration.

Smoking and alcohol

It should be highlighted, that 13.9% of the complete sample was still smoking. 8.5% of the employees smoked daily. Almost one third of all the answerers (29.7%) smoked daily for a year long period, but they quitted. Those who once smoked and/or were still smoking started to smoke regularly at the average age of 18.5 years (SD=2.71). 63,2% of those workers who were still regular smokers smoked 1-10 cigarettes a day, and some of them smoked 11-20 cigarettes a day.

13.9% of the complete sample did not drink alcohol, while 40.4% drank alcohol only at feasts or during visits. 16.6% drank 2-3 times a month, and 16.6% drank a small amount several times a month. Only 5 answerers (2.2%) reported on drinking a small amount of alcohol daily or several times a day.

Physical activity

78.2% of respondents performed some kinds of physical exercises. Into physical exercise we included active walking, jogging and cycling performed at least once a week also. Respondents performed exercises 1-2 days a week (33.7%), 3-4 days a week (22.1%), 5 days a

week (20.0%), or daily (24.2%). 44.8% of workers were doing sports. 12.7% of the asked workers did not perform any exercises or sports.

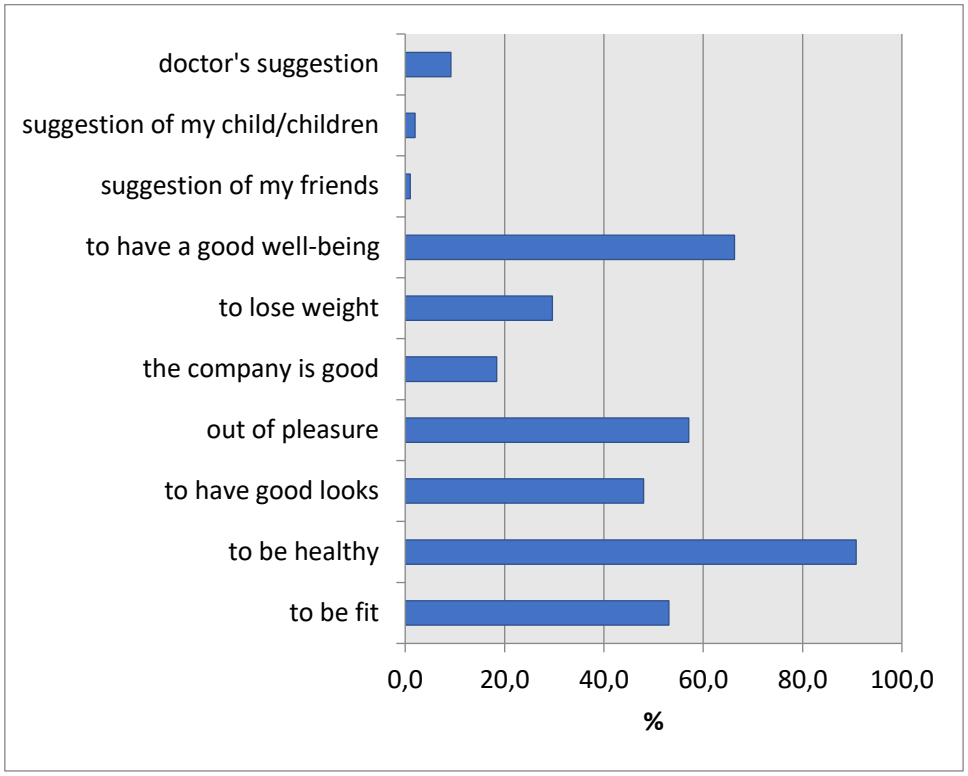

Figure 1 *Reasons behind doing sports (%, N=117)*

Sports were performed generally several times a week (79.4%), often twice a week (32.0%), or three-four times (30.9%). The reason behind doing sports was not because their friends or child/children suggested it *(Figure 1)*, but primarily because of becoming healthy (90.8%), and secondly because of creating a good well-being (66.3%). A characteristic reason was to do sports out of pleasure (57.1%) or to become fit (53.1%) or to look good (48.0%). In nine cases (9.2%) the doctor suggested the respondent to do sports.

Leisure time

Respondent members of the university staff did work related tasks at home or in their workplaces, an average of 2.5 hours even on an ordinary day off. They slept 8 hours on an ordinary day off, spent 6-6.5 hours working on work-related plus household chores, and 4-4.5 hours with active leisure. The number of hours spent on leisure activities was favourable among the respondents. Respondents spent their leisure time mainly with reading, discussions, visiting others, cooking and baking, walking, watching TV, listening to music, going for excursions, gardening or doing sports *(Table 3)*.

Table 3 *Activities the university staff spend their leisure time with (N=261)*

Activity	**n**	**%**
Visit places of amusement	24	9.0
Listening to music	97	37.2
Playing music	24	9.0
Watching TV	114	43.5
Cinema	34	13.0
Theatre, concert	54	20.6
Discussions, visiting	164	62.8
Sport	75	28.7
Gardening	95	36.3
Do it yourself	31	11.7
Handcraft	36	13.9
Chess, cards, bridge, board games	27	10.3
Billiard, bowling	7	2.7
Other games	35	13.5
Reading	191	73.1
Cooking, baking	142	54.3
Walking	126	48.4
Excursion	97	37.2
Hunting	4	1.4
Grandchild	4	1.4
Language learning	4	1.4

In an average weekday, they had almost 2 hours (mean=1.84, SD=1.29) to spend on leisure activities. Only 5.4% of respondents declared they did not have time for leisure during weekdays. This weekday leisure time was spent mainly at home, or with friends, or in cultural facilities, and there were also some employees visiting relatives or going to sport facilities *(Figure 2)*. Almost one-third of respondents spent this time with browsing the Internet, skype or watching films on-line.

There were only a few people who spent their leisure time in a club or in a community centre during weekdays. There were also some staff members (2.7%) who did not have any time for leisure during weekends. During the weekends leisure time was spent mostly with friends and relatives, or at cultural facilities, shopping centres, or cinema *(Figure 2).*

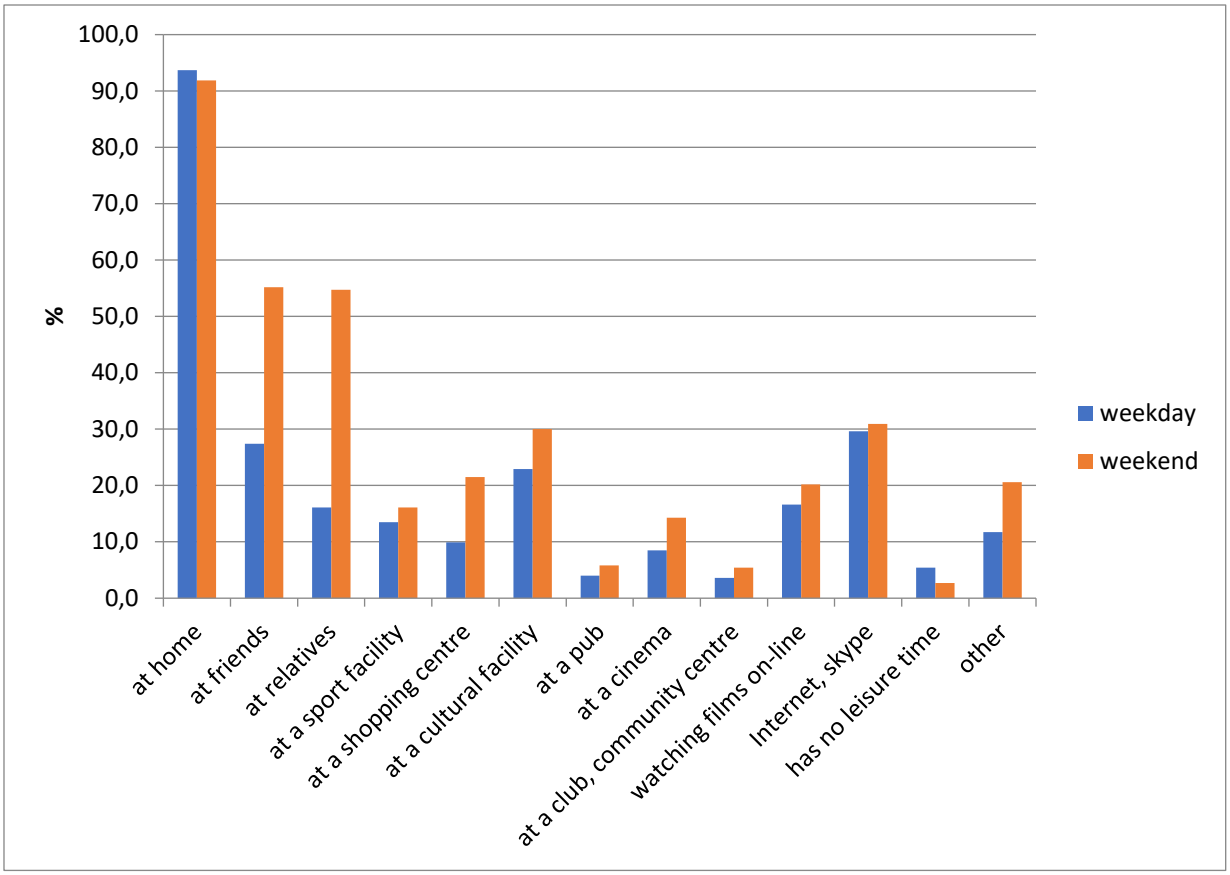

Figure 2 *Ways of spending leisure time during the week and in the weekends (N=261)*

During the last 3 years, as a leisure activity, almost half of university staff respondents spent their holidays inland three or more times, while spending holidays abroad characterised only one-third of them *(Table 4).* Approximately 40% of respondents had not been on a holiday abroad at all during the past 3 years.

Table 4 *The frequency of spending holidays inland and abroad during the past 3 years*

Frequency	**Inland n (%)**	**Abroad n (%)**
never	37 (16.6)	86 (38.6)
one time	32 (14.3)	50 (22.4)
two times	51 (22.9)	25 (11.2)
three or more times	103 (46.2)	62 (27.8)
Total	223 (100.0)	223 (100.0)

Those, who were not participating in an inland holiday in the past 3 years reported almost in all cases no holiday abroad as well (26 respondents out of the 37 ones) *(Table 5).* However, almost the half of those who had the opportunity to spend their holiday inland three or more times could go for a holiday abroad with a similar frequency as well (46 respondents

out of the 103 ones) *(Table 5)*.

Table 5 *Number of inland and foreign holidays in the past 3 years (number of people)*

Holidays		Number of foreign holidays in the past 3 years				
		None	**One**	**Two**	**Three or more**	**Total**
Number of inland holidays in the past 3 years	**None**	**26**	5	2	4	37
	One	16	8	3	5	32
	Two	20	19	5	7	51
	Three or more	24	18	15	**46**	103
	Total	86	50	25	62	223

Participation in screening

Women went to breast screening in every two years (42.4%), or less (34.0%), participation in cervix screening was mainly of yearly frequency (64.5%). There was a considerable number of women who participated in cervix screening with less than a two years frequency (18.7%). The male respondents generally went for prostate cancer screening with a less than two years frequency (84.9%). The respondents participated in skin cancer (62.9%) and mouth cancer (77.5%) screenings less than every two years. However, there were respondents who went for a skin cancer screening in every year (21.8%) or in every two years (15.2%). In general, it was true, that women were more conscious about their own health than the male ones, and considered the importance of their health higher than their male co-workers. There were also significant differences between men and women concerning participation in colorectal screening ($\chi 2=8.54$, $p=0.04$). Women participated mainly with a less than two years frequency, while men did the same with a similar frequency (91.4%), and showed a yearly participation (3.5%).

4.1.3. Health behaviour, subjective health status and health promotion

Respondents considered their own health status quite good on a scale of 5 (mean=3.7, SD=0.80). There was a considerable correlation between the subjective judgement of one's own health status and the extent he or she considered own health important *(Table 6)*. Those, who

were more satisfied with their fitness considered their health more important. Those respondents, who were more satisfied with their fitness, looks and health considered their own health status better than those less satisfied ones *(Table 6)*.

Table 6 *Correlation between satisfaction with and importance of own health*

	Importance of own health	Subjective opinion about own health status
Importance of own health	1.00	**0.26**
Subjective opinion about own health status	**0.26**	1.00
Satisfaction with own health	0.23	**0.70**
Satisfaction with own fitness	0.20	**0.55**
Satisfaction with looks	0.23	**0.46**

The table contains the Spearman rho values. Each data in the table indicate a significant correlation on level $p<0.01$.

Analysis of the connection between place of spending leisure time and own judgement of health status revealed, that those, who spent their leisure time in sport facilities ($t=3.56$, $p<0.01$), or with friends ($t=3.06$, $p<0.01$) evaluated their health status higher than those who spent their leisure time at home or in shopping centres.

Participants considered the promotion and protection of their own health very important. On a scale of 10 the mean was 9.2 (SD=1.17). More than half of the sample (60.5%) reported they had a family member who was extremely conscious about the health of all members. This person was either the respondent (43.2%), or his/her spouse/partner (36.8%). In some cases, it was the child or the parent who considered health protection of family members as his/her job.

A considerable percentage of participants had knowledge about health, health protection and healthy behaviour (96.6%). 43.3% of the sample obtained this knowledge through their profession, 53.3% learnt them because they were interested in them.

4.1.4. Working conditions

At the time of data acquisition participants – except for 5 people – were active workers (98.1%), 86.6% working as employees, while 11.5% worked in managerial positions.

More than one-fourth of respondents were exposed to noise, vibration, infection risk, and were working in the presence of chemicals, dust, and gas *(Figure 3)*. These exposures were more frequently characterised by employees of the health-care, than the non-health-care oriented faculties: infection risk (48.5% vs. 19.8%; $p<0.001$); chemicals, dust, gas, smoke,

steam (41.5% vs. 13.7%; p<0.001); radiation (20.0% vs. 6.9%; p=0.002); lifting heavy weights (e.g. patients), uncomfortable posture (17.7% vs. 7.6%; p=0.014) and accident risk (30.8% vs. 14.5%; p=0.002).

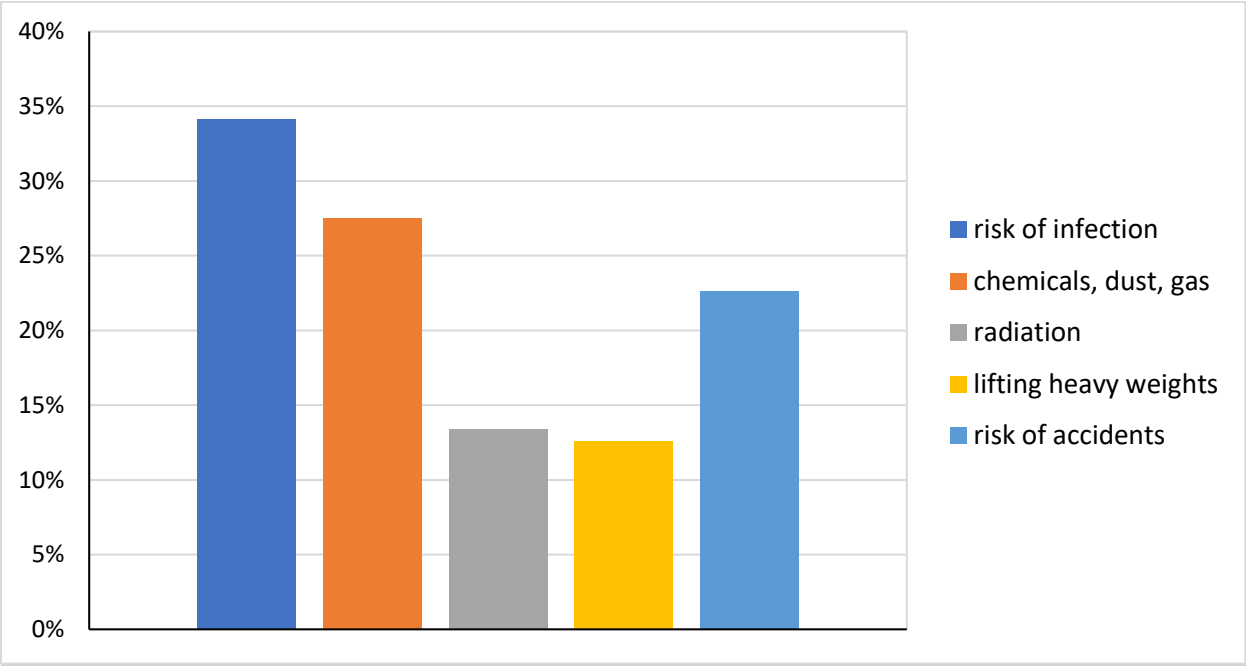

Figure 3 *Frequency of health damaging working conditions (N=261)*

Within five years preceding the present survey there were several measures at the university which were characterised by the employees as improvements to their working conditions. These health protecting and health promoting measures obtained the average result of 4.50±2.35 on a scale of ten. Such improvements were the separate dining rooms and possibilities to heat and store food (52.1%), installing an air conditioner (44.1%), ergonomic changes, such as providing furniture adjustable to the individual needs (32.2%), continuous upgrading of computers (29.9%), the possibility to have a break during work (24.1%), as well as ensuring a flexible working time that is compatible with family conditions (44.8%). There were a considerable number of employees (17.6%) who thought there were no such measures within the past five years.

Employees worked at their workplace daily 7.79±1.77 hours on average, while further 1.97±1.58 hours were spent on doing overtime. Men spent significantly (p=0.015) more time (2.32±1.47 hours) overtime, than women (1.78±1.61 hours). Those who were living in Szeged did an average of 2.06±1.57 hours overtime, while commuters spent 1.39±1.52 hours (p=0.031)

on extra work. There were no differences in doing overtime by family status and the number of children.

Respondents spent an average of 5.00±2.55 hours daily in front of the computer. There was a negative correlation between age and computer use ($p=0.008$), that is, the older someone was, the less time he/she spent with working on the computer (20-29 years old 5.68±2.12 hours vs. above 60 years 3.64±1.83 hours).

Respondents considered their work more mentally (average: 6.77±2.31) than physically demanding (average: 4.18±2.49). Physical and mental stress were in close connection ($r=0.37$, $p<0.01$), those, who found their work physically demanding considered it to be mentally demanding, too. The older the employee was, the more mentally demanding his/her work was considered to be ($r=-0.21$, $p<0.01$). There were no gender differences in terms of physical and mental stress, and having children or being childless did not matter either. We haven't found differences between employees of health-care oriented and non-health-care oriented faculties either. By the increase of working hours the level of mental ($r=0.19$, $p<0.01$) and physical stress ($r=0.15$, $p<0.05$) became higher, as well as physical ($r=0.23$, $p<0.01$) and mental strain ($r=0.14$, $p<0.05$) was experienced. At the same time, the hours spent in front of the computer showed a negative correlation with the number of extra working hours ($r=-0.20$, $p<0.01$), the more someone worked with a computer, the less overtime was reported.

Respondents declared that they had the possibility to utilize their knowledge and skills, and to make individual choices; their work required many independent ideas and inventiveness *(See also Table 7)*. It is worth noting however, that at the same time permanent stress, close deadlines and frequent overtime also characterised their work.

There were significant gender differences in the following specificities of work: the work required several independent ideas and inventiveness ($p=0.028$); the possibility to make independent decisions ($p=0.033$); promotion possibility ($p=0.004$). These elements specified men's work mainly.

38.3% of respondents considered their work monotone; this opinion was closely connected to age ($p=0.014$): young adults expressed this opinion significantly more often (60.9% of 20-29 year olds) than elder employees (26.3% of 60 and above year olds). There were significant differences according to financial status also ($p=0.010$); 81,8% of those in very bad financial status, while only 22.2% of those in very good financial position considered monotony partly or completely characteristic.

There were significant differences by financial status in how close deadlines affected the perception of work (p=0.015). Those in very good financial position were less characterised by close deadlines (55.6%), while those in a very bad financial situation (81.8%) thought close deadlines to be more characteristic to their work.

56.5% of respondents found the possibility to get a promotion at work characteristic. Men thought so to a higher extent than women (69.4% vs. 50.3%, p=004). This opinion was considerably influenced by financial status (p=0.010): those in a very bad or bad financial situation found their possibilities less favourable (45.5% and 39.7%) than those in a very good or good financial position (66.7% and 72.3%).

On a scale of ten work atmosphere was considered to be quite good (6.87±2.02). Working conditions and mental strain negatively correlated, that is, the better someone thought work environment was, the less mentally demanding (r=-0.17, p<0.01) his/her work was considered to be. There were no significant differences along the different demographical indices (gender, age etc.).

Mainly moral and human appreciation characterised the university staff (55.9%), and the least appreciation came from the financial aspect (22.2%) *(Figure 4)*.

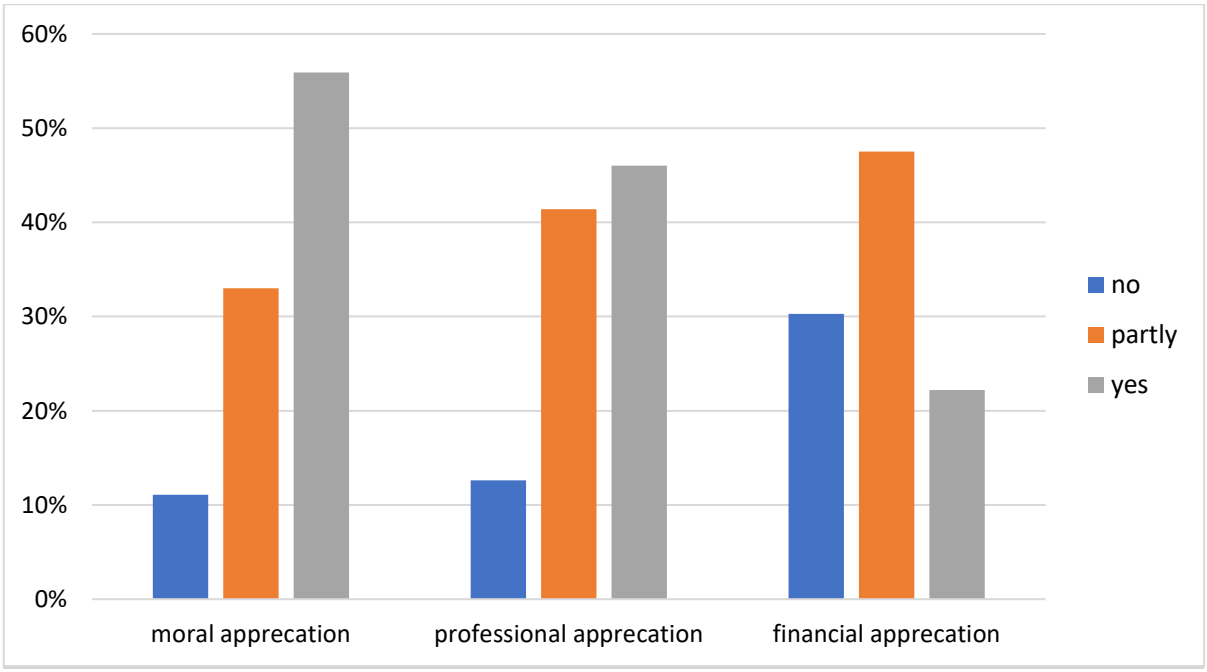

Figure 4 *Self-perceived moral, professional and financial appreciation of employees at work (N=261)*

Financial appreciation was judged differently by men and women, while professional and moral appreciation was not. Men considered their financial status better than women ($p=0.019$). Financial status and financial appreciation ($p<0.001$), as well as professional appreciation ($p=0.002$) were considerably interdependent. Those who considered their financial situation very good, felt themselves financially more appreciated than those who considered it only adequate. Those who considered their financial situation bad or very bad did not feel financially appreciated at their work at all. Similar relationship was found between financial status and professional appreciation too.

We have examined the opinions on working atmosphere by moral appreciation also. There was a clear relationship proven. According to feeling morally fully, partially or not appreciated a different opinion was expressed concerning the work atmosphere ($p<0.001$). For example, those, who felt themselves morally, humanly completely appreciated evaluated the working atmosphere on average 3.85 points higher than those who felt no appreciation (7.82 vs. 3.97 points).

The same relationship was found in case of professional appreciation and working atmosphere ($p<0.001$). Those university employees who felt professionally more appreciated evaluated their work atmosphere on average 3.20 points higher than those who did not feel professionally appreciated (7.78 vs. 4.58 points).

Similar, but somewhat refined results were obtained by involving the financial appreciation variable. Groups formed according to financial appreciation saw their work atmosphere differently ($p<0.001$). Those who felt themselves completely or only partially appreciated financially had the same view on their work atmosphere, there were no significant differences between the two groups. However, those missing financial appreciation considered their work atmosphere on average 1.70 and 1.78 points worse.

4.1.5. Factor analysis of working conditions

A principal component analysis 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.

Five principal components were identified during the analysis *(Table 7)*. For the sake of comprehensibility, the individual principal 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 (four 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. Focusing on the analysis of psychosocial components, the first, second and fourth principal 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 principal components was checked by defining Cronbach's alpha, which exceeded, in the case of each psychosocial principal component, the expected minimum of 0.7 *(Table 7)*.

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 7)*. 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%).

Table 7 *Work environment characteristics resulting from the principal component analysis; the incidence of individual components in the complete sample*

Variables	**%**	**Component loads**	**Defined variance**	**Cronbach's alpha**
Component 1: Job demands			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		
Component 2: Autonomy			13.178	0.757
possibility of independent decisions	80.8	0.846		
work requiring autonomous ideas and inventiveness	87.7	0.819		
possibility of utilizing own knowledge and skills	84.7	0.707		
possibility of job promotion	56.5	0.600		
Component 3: Biological, chemical agents			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		
Component 4: Negative social interactions			10.908	0.739
violent behaviour of colleagues	11.5	0.823		
discrimination	12.3	0.806		
bullying	17.2	0.710		
Component 5: Physical agents			9.790	0.590
effects of heat	9.2	0.859		
effects of radiaton	13.4	0.720		
noise, vibration	37.9	0.548		

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 8)*.

Table 8 *Psychosocial principal components (1, 2, 4) by sex*

Variables	Sex		P-value*
	Men	Women	
	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 9).* 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 9).*

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 9).*

Table 9 *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***
Relationship to colleagues			0.099		0.052		<0.001[1]
A) Harmonius, 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	
Relationship to superiors			0.018		0.002[2]		0.004[3]
A) Harmonius, 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	
Financial appreciation			0.005[4]		0.001[5]		0.022[6]
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	
Professional appreciation			<0.001[7]		<0.001[8]		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	
Moral appreciation			<0.001[9]		0.001[10]		<0.001[11]
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 test.

[1]Significant results of post hoc testing (p-value): A and D (0,006); B and D (0,012); A and C (0,019); [2]Significant results of post hoc testing (p-value): A and D (0,006); A and B (0,040); [3]Significant results of post hoc testing (p-value): A and D (0,010); B and D (0,007); [4]Significant results of post hoc testing (p-value): A and C (0,003); [5]Significant results of post hoc testing (p-value): A and C (0,002); C and B (0,012); [6]Significant results of post hoc testing (p-value): A and C (0,019); [7]Significant results of post hoc testing (p-value): A and C (0,043); A and B (0,000); [8]Significant results of post hoc testing (p-value): A and C (0,000); A and B (0,000); [9]Significant results of post hoc testing (p-value): A and B (0,002); A and C (0,005); [10]Significant results of post hoc testing (p-value): A and C (0,001); [11]Significant results of post hoc testing (p-value): A and C (0,000); B and C (0,001)

4.2. Study of university students (Study 2)

4.2.1. Characteristics of students

The characteristics of the student sample (N=246) are summarised in Table 10. Mainly women and first graders completed the questionnaire (*Table 10*). As soon as the COVID-19 vaccine was available, the majority of students (n=218, 88.6%) received it, henceforth we refer to their willingness to vaccinate, compared to those who received the vaccine only after it becoming mandatory or not at all (n=28, 11.4%), which we considered as vaccination reluctance. Only 14.2% of the students had received the seasonal flu vaccine regularly, and the majority (58.1%) had never been vaccinated with this vaccine (*Table 10*).

Table 10 *General and vaccination willingness characteristics of the sample (N=246)*

Characteristics		**n**	**%**
Sex			
Women		131	53.3
Men		115	46.7
Grade			
1st grade		153	62.2
4th grade		93	37.8
COVID-19 vaccination			
Vaccination willingness	yes, as soon as the vaccine was available	218	88.6
Vaccination reluctance	yes, when it became compulsory for university students	21	8.5
	no	7	2.9
Vaccination with seasonal flu vaccine			
yes, regularly		35	14.2
yes, occassionally		68	27.7
never		143	58.1

4.2.2. Health behaviour of medical students

In terms of smoking habits, there were significant differences in lifetime prevalence also by sex and grade, with a higher proportion of men and fourth-year students having used some type of tobacco product. The proportion of students who were current smokers did not show a significant difference, but was slightly higher for men and fourth-year students *(Table 11).*

Frequency of alcohol consumption in the past 12 months differed significantly by sex and grade. The highest rates were for drinking alcohol 2-4 times a month *(Table 11).*

Table 11 *Frequency of smoking and alcohol consumption by sex and academic year*

Health behaviour	**Sex**		**p-value[1]**	**Academic year**		**p-value[1]**
	women n (%)	**men n (%)**		**1st year n (%)**	**4th year n (%)**	
Lifetime prevalence of tobacco use	96 (73.3)	96 (83.5)	0.054	111 (72.5)	81 (87.1)	0.008
Actual prevalence of cigarette smoking	9 (6.9)	13 (11.3)	0.224	13 (8.5)	9 (9.7)	0.753
Last year frequency of alcohol drinking			0.023			0.019
4–6/week	3 (2.3)	5 (4.3)		2 (1.3)	6 (6.5)	
2–3/week	16 (12.2)	23 (20.0)		26 (17.0)	13 (14.0)	
2–4/month	60 (45.8)	63 (54.8)		76 (49.7)	47 (50.5)	
once a month or rarely	41 (31.3)	20 (17.4)		35 (22.9)	26 (28.0)	
never	11 (8.4)	4 (3.5)		14 (9.2)	1 (1.1)	
Last year frequency of 5 (men) or 4 (women) alcohol drinks			0.017			0.004
weekly[2]	17 (13.1)	21 (18.3)		18 (11.8)	20 (21.5)	
monthly[2]	43 (33.1)	55 (47.8)		62 (40.8)	36 (38.7)	
less than monthly	48 (36.9)	29 (25.2)		44 (28.9)	33 (35.5)	
never	22 (16.9)	10 (8.7)		28 (18.4)	4 (4.3)	

[1]Results from Chi-square test; [2]Binge-drinking

Binge drinking (drinking 5 or more alcoholic drinks in a short period of time for men and 4 or more drinks at least once a month for women) was also dominant among men, with a high prevalence of binge drinking per week among fourth-year students (*Table 11*).

There was a significant difference in vegetable/vegetable juice consumption by sex, with women consuming a much higher proportion of vegetables more than once a day (*Table 12*). There were no significant differences in fruit consumption in any of these aspects.

In terms of physical activity, there was a significant difference by sex only in the case of intense physical activity, which was less characteristic of women (*Table 12*).

Table 12 *Nutrition and physical activity*

Health behaviour	Sex		p-value[1]	Academic year		p-value[1]
	women n (%)	men n (%)		1st year n (%)	4th year n (%)	
Frequency of vegetable consumption			0.012			0.476
more times per day	36 (27.7)	14 (12.2)		29 (19.1)	21 (22.6)	
daily	23 (17.7)	20 (17.4)		25 (16.4)	18 (19.4)	
4–6/week	32 (24.6)	31 (27.0)		42 (27.6)	21 (22.6)	
1–3/week	30 (23.1)	29 (25.2)		38 (25.0)	21 (22.6)	
rarely than weekly	7 (5.4)	19 (16.5)		14 (9.2)	12 (12.9)	
never	2 (1.5)	2 (1.7)		4 (2.6)	0 (0.0)	
Frequency of fruit consumption			0.329			0.278
more times per day	27 (20.6)	12 (10.5)		23 (15.1)	16 (17.2)	
daily	20 (15.3)	19 (16.7)		23 (15.1)	16 (17.2)	
4–6/week	27 (20.6)	26 (22.8)		38 (25.0)	15 (16.1)	
1–3/week	40 (30.5)	35 (30.7)		41 (27.0)	34 (36.6)	
rarely than weekly	16 (12.2)	20 (17.5)		24 (15.8)	12 (12.9)	
never	1 (0.8)	2 (1.8)		3 (2.0)	0 (0.0)	
Frequency of intensive physical activity			0.013			0.360
3 or more times/week	22 (16.8)	40 (34.8)		33 (21.6)	29 (31.2)	
1–2 times/week	63 (48.1)	46 (40.0)		70 (45.8)	39 (41.9)	
1–2 times/month	31 (23.7)	20 (17.4)		35 (22.9)	16 (17.2)	
never	15 (11.5)	9 (7.8)		15 (9.8)	9 (9.7)	
Frequency of moderate physical activity			0.081			0.367
daily, nearly everyday	21 (16.0)	24 (20.9)		28 (18.3)	17 (18.3)	
3–4 times/week	19 (14.5)	22 (19.1)		22 (14.4)	19 (20.4)	
1–2 times/week	55 (42.0)	30 (26.1)		50 (32.7)	35 (37.6)	
1–2 times/month	30 (22.9)	28 (24.3)		42 (27.5)	16 (17.2)	
never	6 (4.6)	11 (9.6)		11 (7.2)	6 (6.5)	

[1]Results from Chi-square test

We have not found any significant differences by sex and grade in case of the frequency of how much responding students could do for their health (*Table 13*). When indicating how health-conscious their lifestyle was, we have found a significant difference by sex, but no significant differences by grade (*Table 13*). Women seem to lead a more health-conscious lifestyle than men in case of the observed student sample.

Table 13 *Health conscious behaviour of students*

	Sex		p-value[1]	Academic year		p-value[1]
	women n (%)	**men n (%)**		**1st year n (%)**	**4th year n (%)**	
Frequency of 'how much can you do for your health'			0.845			0.106
nothing	1 (0.8)	1 (0.9)		2 (1.3)	0 (0.0)	
a little	3 (2.3)	4 (3.5)		6 (3.9)	1 (1.1)	
much	29 (22.1)	21 (18.3)		36 (23.5)	14 (15.1)	
very much	98 (74.8)	89 (77.4)		109 (71.2)	78 (83.9)	
Frequency of how health-conscious your lifestyle is			0.034			0.666
not at all	1 (0.0)	8 (7.0)		6 (3.9)	2 (2.2)	
a little	15 (11.5)	12 (10.4)		19 (12.4)	8 (8.6)	
moderately	42 (32.1)	39 (33.9)		49 (32.0)	32 (34.4)	
most of the time	58 (44.3)	41 (35.7)		58 (37.9)	41 (44.1)	
highly	16 (12.2)	15 (13.0)		21 (13.7)	10 (10.8)	

[1]Results from Chi-square test

4.2.3. Students' attitude toward vaccination

Among the 18 statements regarding attitudes towards recommended vaccinations *(Table 14)*, men were more likely to report "I do not need the recommended vaccinations if I lead a healthy lifestyle" (18.3% vs. 6.1%, $p<0.01$) and "Do not receive recommended vaccinations due to political or religious beliefs" (27.0% vs. 14.5%, $p<0.05$). There were significant differences in opinion by grade for several statements. The statements „If I am afraid of a particular disease, I will receive the recommended vaccination" (89.2% vs. 78.4%, $p<0.05$) and „I have enough information and knowledge about communicable diseases to decide on the recommended vaccination" (81.7% vs. 58.8%, $p<0.001$) were more typical of the students in 4th year, while the other statements (statements 6-8, 12-15) were more typical of 1st year.

Table 14 *Assessment of vaccination statements by willingness to vaccinate - odds ratio of "typical" responses - multivariable logistic regression analysis (N=246)*

Statements	**Total n (%)**	**Vaccination willingness AOR (95% CI)**
1. I do not need any recommended vaccinations, my immune system is regularly strengthened.	61 (24.8)	0.13 (0.05; 0.31)***
2. If my family doctor recommends a vaccine, I will receive that vaccine.	188 (76.4)	4.13 (1.79; 9.53)***
3. The efficacy of the recommended vaccine is important information for me, it influences my decision whether to receive the recommended vaccine.	185 (75.2)	1.36 (0.57; 3.25)
4. If I am afraid of a particular disease, I will receive the recommended vaccination.	203 (82.5)	5.77 (2.45; 13.60)***
5. Vaccines are not the only way to protect against infectious diseases, which is why I do not receive a recommended vaccination.	43 (17.5)	0.18 (0.08; 0.43)***
6. I do not request the recommended vaccination because I do not have sufficient information about the disease that I could avoid by receiving the vaccine.	35 (14.2)	0.42 (0.16; 1.10)
7. I do not need vaccines, I am not affraid of infectious diseases.	24 (9.8)	0.40 (0.14; 1.16)
8. I do not need the recommended vaccinations if I lead a healthy lifestyle.	29 (11.8)	0.15 (0.05; 0.41)***
9. If I have a history of the disease in my family or friends, I will receive the recommended vaccination.	154 (62.6)	3.73 (1.61; 8.63)**
10. The price of the recommended vaccination will influence whether I request the vaccination.	65 (26.4)	1.49 (0.57; 3.92)
11. I am requesting the recommended vaccination because of a previous illness.	123 (50.0)	2.75 (1.14; 6.61)*
12. I do not receive recommended vaccinations, I am distrustful of certain health information.	28 (11.4)	0.29 (0.11; 0.78)*
13. I don't need the recommended vaccinations, fighting the disease strengthens my immune system.	37 (15.0)	0.28 (0.12; 0.70)**
14. I don't receive the recommended vaccinations because I'm afraid of the vaccination, the pain it causes.	24 (9.8)	0.22 (0.08; 0.59)**
15. I do not receive the recommended vaccinations because I am afraid of side effects.	31 (12.6)	0.17 (0.07; 0.42)***
16. I sometimes disregard the price of the recommended vaccination, the aim is to avoid infectious disease.	150 (61.0)	1.76 (0.78; 3.96)
17. I have enough information and knowledge about communicable diseases to decide on the recommended vaccination.	166 (67.5)	2.14 (0.94; 4.86)
18. Do not receive recommended vaccinations due to political or religious beliefs.	50 (20.3)	0.96 (0.36; 2.59)

Reference category (OR=1.00): vaccination reluctance; AOR: adjusted odds ratio (by sex and grade); CI: confidence interval; * p<0.05; ** p<0.01; *** p<0.001

In the cross-table analyses by willingness to vaccinate, there were significant differences in the characteristics of all except four statements (*Table 14*, statements 3, 10, 16 and 18). These differences were mostly retained in multivariable analyses adjusted for sex and grade (except for statements 6, 7 and 17). Students with a willingness to vaccinate based on odds ratios preferred the following statements:

- If my family doctor recommends a vaccine, I will receive that vaccine.
- If I am afraid of a particular disease, I will receive the recommended vaccination.
- If I have a history of the disease in my family or friends, I will receive the recommended vaccination.
- I am requesting the recommended vaccination because of a previous illness.

The following statements were preferred by students showing vaccination reluctance:

- I do not need any recommended vaccinations, my immune system is regularly strengthened.
- Vaccines are not the only way to protect against infectious diseases, which is why I do not receive a recommended vaccination.
- I do not need the recommended vaccinations if I lead a healthy lifestyle.
- I do not receive recommended vaccinations, I am distrustful of certain health information.
- I don't need the recommended vaccinations, fighting the disease strengthens my immune system.
- I don't receive the recommended vaccinations because I'm afraid of the vaccination, the pain it causes.
- I do not receive the recommended vaccinations because I am afraid of side effects.

5. Discussion

The health promotion programme of the university can be improved if we get to know the characteristics of the health behaviour and working environment of the university staff and students. Health is one of our most important human values, and its preservation and promotion is in the interest of the university employee, the student and, beyond that, the employer, the university's management. Among the factors that influence health, we highlighted the importance of lifestyle and the environment. The effectiveness of the health promotion strategy of the employer and the university management depends on the knowledge of the health-promoting or health-damaging behaviour of employees, students and the specificities of the working environment of university employees.

Employees' health behaviour can also be an example, as the rate of smokers is low and alcohol consumption is also mild. In Hungary, the proportion of smokers increased between 2002 and 2021 (Brys, et al., 2022), but it is positive that the proportion of daily smokers decreased between 2009 and 2019 (Hungarian Central Statistical Office, 2020). 13.9% of university employees (those with secondary and tertiary education) smoke, which is close to the EHIS 2019 results for Hungary, which show that one in seven people with tertiary education smoke (Hungarian Central Statistical Office, 2021b). 8.9% of the students in our study use some form of tobacco products, which is considered a low number based on the Hungarian EHIS 2019, which found that the highest rates of tobacco use were among 18-34 year olds (Hungarian Central Statistical Office, 2021b). There are more heavy drinkers among men in Hungary (Hungarian Central Statistical Office, 2021a), and our survey found the same result among students. It could also be highlighted, that the observed employees drink tap water and mineral water mainly, eat less fatty meat, do not use excessive salting and prefer mixed nutrition. They spend their free time usefully, with nurturing their social bonds, as well as with engaging in cultural and physical activities. Almost 50% of people with tertiary education take exercise to stay healthy, according to the EHIS 2019 (Hungarian Central Statistical Office, 2021f), as do the employees of the University of Szeged (44.8% participate in sports activities). The presence of one or two intense physical activity sessions per week is also above 40% among students, with male students being more likely to engage in more intense sports activities on a weekly basis.

Some aspects of their nutrition, however, needs improvement. Such aspects are the right amount of eating during the day, the preference of whole grain bread to the white one, and the higher frequency of eating raw vegetables and fruits. The daily consumption of fruit and

vegetables is below 20% among both workers and students, which is less than half of the European Health Interview Survey 2019 results (over 40% of the national population aged 15 and over consumes fruit and vegetables) (Hungarian Central Statistical Office, 2021e).

Our research data revealed that health was very important for the employees of the University of Szeged, especially for female workers. University staff rated their own health as fairly good/satisfactory, and the proportion of those in the Hungarian population who rated their health as good or very good also increased over 10 years (2009-2019) (Hungarian Central Statistical Office, 2020). With only a few exceptions they all had knowledge concerning health, health protection and healthy lifestyle. This knowledge they acquired out of interest or possessed due to their profession. Health knowledge and consciousness was also reflected in their actual health behaviour, providing an excellent example for their students. 98% of Hungarians think they can do something about their health, 84% think much or a lot depends on the individual (Hungarian Central Statistical Office, 2020). University employees also emphasize the role of the individual in promoting and protecting their own health. Over 95% of students say they can do much, a lot, to protect their own health.

Vaccination is an important tool for health promotion and prevention. According to the WHO SAGE definition, 11.4% of students were classified as uncertain about vaccination ("vaccination reluctance"), with the majority in the "vaccination willingness" group. We examined attitudes towards vaccinations among students based on statements about recommended vaccinations. Some statements characterised mostly men ("I do not need the recommended vaccinations if I lead a healthy lifestyle") or higher („I have enough information and knowledge about communicable diseases to decide on the recommended vaccination”) or lower graders (“I do not receive recommended vaccinations, I am distrustful of certain health information.”). Among first-year students with less theoretical (and practical) knowledge, there were more uncertain than among fourth-year students, for whom the more secure knowledge, the positive influence of the knowledge acquired during university, prevailed. Misconceptions (e.g. “I do not need any recommended vaccinations, my immune system is regularly strengthened.”) are present among students as well.

The mainly employee and a smaller number of managerial university staff worked under suitable working environment in general, except for those working at a health-care oriented area, who were more negative about their work conditions.

Employees referred to several measures carried out during the previous five years targeting at preserving and promoting health to create a more optimal working environment. Such measures were the introducing of breaks during work, the adjustable furniture, the

upgrading of computer systems etc. These however were considered to be not enough by some employees.

Employees dealt with their work 10–10.5 hours daily, part of which had to be done overtime. The pressure to work extra hours characterised men and local employees mainly. By the increase of working hours and extra work time the physical and mental strain was also higher. Those, who worked more extra hours considered their health status worse, which result was underlined by an international survey as well (Pisljar, et al., 2011). The research by Pikó and Piczil (2007) carried out among health-care workers also showed more negative feelings towards own health by the increasing extent of extra work.

Today computer use at work is essential. Respondents worked with computers 5 hours daily on average; it was observed that by the increase in age less time was spent with computers. Borghans and ter Weel (2002) performed their age-related comparative study on German, English and American samples and found the same results, namely, the computer use of employees above the age of 49 decreases and they consider it less important. More frequent computer work increases the incidence of eye and musculoskeletal problems, with these effects becoming more frequent with age (Berényi & Sasvári, 2021). This is why it is important for workers to pay attention to the amount of time they spend working at the computer and the continuity of their work, in order to avoid negative changes in their health. In our study, it is positive that university workers spend less time on computers as they get older, thus preventing the possibility of developing the eye and musculoskeletal problems that are increased by more frequent computer use (Berényi & Sasvári, 2021).

Work was considered to be mentally demanding mainly, the stress appearing to be higher by age. Pikó and Piczil (2007) obtained similar results among health-care workers; by age there was an increase in the feeling of mental strain. Their work was basically characterised by permanent stress (73.2%), close deadlines (80.4%), and frequent overtime (64.2%). A considerable part of them was continuously afraid of losing their job.

Our positive result was that a considerable proportion of respondents found their working atmosphere suitable, with good workplace relationships.

There were differing views on financial, professional and moral, human appreciation. The feeling of professional appreciation was higher among the non-health-care oriented faculty employees, staff of faculties with a medical profile felt so only partly. Feeling financially appreciated was not significant among the university staff, only half of respondents considered their financial situation suitable, while almost one-third considered it definitely bad or very bad. Petőné's (2014) human capital research among higher education staff also highlighted at the

importance of being appreciated at work. As she states „The satisfaction of the teaching staff influences the quality of work and motivation, their further education plans, self-developing activities and their loyalty to the institute". (Petőné, 2014, 301.) There are more and more tasks required in higher education, and it is harder and harder to meet the requirements; work intensity, considering the decrease in the proportion of qualified staff compared to the increase in the number of students, is more and more demanding. Wages do not follow these changes; higher education employees work for nearly the same income for a long time. Unterbrink et al. (2007) showed that more than one-fifth (21.6%) of secondary school teachers make high efforts for successful work, while the financial reward is low. When efforts and rewards are not balanced, the result could be not only burnout, but it could also happen that employees have a second job to obtain the right rewarding. The more the worker is characterised by an effort-reward imbalance, the worse they assess their health (Ge, et al., 2021).

The depressive state is considered to be the most stressful and has led to a deterioration in ability to work in Hungary (Kopp & Skrabski, 2000). The results of the European Health Interview Survey 2014 showed that 4% of the Hungarian population were affected by chronic depression (Hungarian Central Statistical Office, 2015), while 1.5% of the population had moderate/severe depression in the 2019 survey, the presence of mild depressive symptoms affected 20% of the population (Hungarian Central Statistical Office, 2021d). In the background of the depressive state observable among the lowest SES adult population, the perception of their conditions is also considerable as one of the risk factors affecting health in the Hungarian population (Susánszky, et al., 2013). Jørgensen et al. (2016) 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 (Bos, et al., 2013). 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 EHIS 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 EHIS 2009 revealed fewer problems than did the Hungarian data (47.5% vs. 15%) (Tokaji, 2011). There were no significant differences by sex in the individual characterising psychosocial risk factors. This is similar to

the results obtained in the EHIS 2009 (Tokaji, 2011). The 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 EHIS 2009, autonomy was more characteristic among Hungarian men (Tokaji, 2011). Theorell et al. (2015) 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 (Salavecz, 2013). 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. (2013) 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. (2015) 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 (Salavecz, 2013), which can be further intensified by workplace conflicts, there are less depressive symptoms in the presence of peer support (Hungarian Central Statistical Office, 2021d), and helps to eliminate work-related stress (Bentley, et al., 2016). 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. (2016) 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. 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 (Rights and responsibilities of employers and employees in creating safe and healthy work environment (1993) XCIII. Law on Safety at Work, Chapter IV., 1993), 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).

6. Conclusions

We found it very important to get to know the health behaviour of higher education employees and students and the characteristics of the working environment of university employees, thus supporting the development of the health promotion programme of the University of Szeged. Those, who work for the University of Szeged cooperate with young adults every day, aiding their effective knowledge acquisition, while at the same time forming students' health behaviour through the example of their own behaviour and habits. Higher education institutes this way have a direct influence on the lifestyle and health of their members.

The health behaviour of university employees is acceptable and can mean a suitable example for the young adult generation. Their nutrition needs improvement in some areas (eating five meals a day, preferring wholemeal bread, eating more vegetables and fruit, preferring other fats to sunflower oil in food preparation). They have a low smoking rate, low alcohol consumption, and spend their free time maintaining social relationships, engaging in cultural and physical activities. With the right level of financial security – which takes account of inflation and price rises – there can be significant improvements in their university staff's eating habits, access to holidays or leisure activities.

Participation in screening programmes generally shows that women are more conscious of their own health than men.

University staff consider their health to be good, health is important to them. Employees who are more satisfied with their fitness rate their health as more important. Employees who

are more satisfied with their fitness, appearance and health consider their own health to be better. People who spend their free time in sports facilities or with friends rate their health as better than those who spend their free time at home or in shopping centres. Employees consider it very important to promote and protect their own health.

To sum all findings up, we can say that employees of the University of Szeged are concerned about their health and act for preserving and promoting it. They strive at creating a good well-being.

With the exception of health care workers, university employees generally work in a suitable working environment. Employees perceive measures to maintain and promote health and to create a more optimal working environment, which some of them consider insufficient.

Our study found that university employees' work is essentially characterised by constant stress, tight deadlines, frequent overtime. The physical and mental strain increases with the increase in working hours and overtime. They work on computers for an average of five hours a day, with computer time decreasing with age. These data call the attention of decision makers for the management of these problems.

A significant proportion of workers consider the working atmosphere to be good and relations with supervisors and colleagues to be good. In faculties that are not health oriented, the sense of professional esteem is higher among employees. The feeling of financial appreciation is not significant among university staff.

According to our results it is advisable to carry on with the measures improving employees' infrastructural working conditions. Through a "favourable" work environment work safety and health protection can be improved. It is also necessary to increase financial appreciation – to ensure proper income –, to prevent employees from establishing their financial security elsewhere, and preserve the high quality education of Hungarian universities, in particular at the University of Szeged.

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.

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.

Students' health behaviour is also acceptable, they have a health promoting attitude and strive to maintain their health. In the case of voluntary vaccinations, which are free of charge, we do not yet have an excellent performance in our country, and we need health professionals, doctors to support it. There are misconceptions among medical students, which is why it is essential to increase knowledge about vaccines, update knowledge and improve communication during their education.

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APPENDICES

Working Environment of Higher Education Staff – a Survey at University of Szeged, Hungary

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Abstract:
The environmental and working conditions do matter in terms of work efficacy, efficiency and our health, too. The aim of our study was to explore the working conditions of the staff of the University of Szeged, Hungary, and to characterize the potential aspects of promoting their health in the workplace. A cross-sectional study was carried out at health-care oriented and non-health-care oriented faculties of the University of Szeged. The online survey based on a self-completed questionnaire about socio-demographic characteristics and working conditions of employees. Data analyses (descriptive and analytical statistics) were performed using IBM SPSS 22.0. The research sample (n = 261) composed of 33.0% male and 67.0% female participants. More than one-fourth of respondents were exposed to noise, vibration, infection risk, and were working in the presence of chemicals, dust, and gas. Work was considered to be mentally demanding mainly, the stress appearing to be higher by age. Respondents worked with computers 5 hours daily on average; it was observed that by the increase in age less time was spent with computers. 56.5% of respondents found the possibility to get a promotion at work characteristic. Mainly moral and human appreciation characterized the university staff (55.9%), and the least appreciation came from the financial aspect (22.2%). Employees dealt with their work 10–10.5 hours daily, part of which had to be done overtime. The pressure to work extra hours characterized men and local employees mainly. By the increase of working hours and extra work time the physical and mental strain was also higher. Summarizing the results, it is advisable to carry on with the measures improving employees' infrastructural working conditions. It is also necessary to increase financial appreciation, to prevent employees from establishing their financial security elsewhere.

Key Words: higher education, working conditions, physical, chemical and mental risk, overtime, moral, professional and financial appreciation

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Abbreviations:
ANOVA: Analysis of variance
SPSS: Statistical Package for Social Sciences

INTRODUCTION

Since the Ottawa Charter for Health Promotion (1986) was issued it is well known that „Health is created and lived by people within the settings of their everyday life; where they learn, work, play and love." The notion of settings evoked the idea of taking the sole responsibility for health off the individual and examine those places and contexts as well where people live their lives (Dooris and Doherty, 2010; Whitelaw et al., 2001). The Health Promotion Glossary (1998) defines the settings for health as „The place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and wellbeing." Accordingly, if health promotion wants to be effective, it should focus on the settings of daily activities (Dooris et al., 2014), like home, workplace, community spheres etc. For those employed by a university, this is the „context within which particular people (students, staff) live aspects of their daily lives and with which others (families, external services, wider community) interact" (Dooris et al., 2014). This important place of teaching, learning and research needs healthy, satisfied and motivated employees to be able to provide high quality services for the society. Satisfaction and motivation are prerequisites of feeling healthy. Feeling of satisfaction is influenced positively or negatively by organizational climate factors, co-worker relationships (Cohen and Wills, 1985; Thomsen et al., 1999; Mizuno et al., 2006), working conditions, organizational commitment, leadership and management (Birbirsa et al., 2015).

Beside the undoubted benefit of regular wages, successful work, positive evaluation, social support of colleagues and superiors increase self-efficacy and sense of control, which in turn promote our health (Stansfeld et al., 1998; Naidoo and Wills, 1999). Feeling of support leads to job satisfaction and helps to create a positive work-related self. However, those working in higher education sometimes need to face several challenges, like decreased funding, worse working conditions, changing professional requirements, less influence and less involvement in decision-making processes (Clarke et al., 2015) or uncertain employment (Karasek, 1989). Working condition is characterized by more students with higher skill differences and special needs, longer working hours, more administrative workload and less opportunities for research, a pressure of raising extra funds and 'publish or perish' as well as a lack of collegiality and promoting social networks (Clarke et al., 2015). All these factors can raise employees' level of stress which in turn might cause psychiatric problems, coronary heart disease, musculoskeletal problems and symptoms associated with gastrointestinal disorders, as well as have consequences regarding job performance and safety. Long working hours lead to fatigue and consequently risky behaviour and longer exposure to physical, chemical and other hazards (Spurgeon et al., 1997; Andrea et al., 2003).

Considering the fact that the environment and working conditions do matter in terms of work efficacy, efficiency and in turn our health, the aim of our study was to explore the working conditions of the staff of the University of Szeged, Hungary, and to characterize the potential aspects of promoting their health in the workplace.

METHODS AND PARTICIPANTS

A cross-sectional study was carried out at health-care oriented (medicine, dentistry etc.) and non-health-care oriented (e.g. economics and business) faculties of the University of Szeged. The online survey was based on a self-completed questionnaire. The sample size was 261 employees. Apart from basic socio-demographic data the questionnaire contained questions referring to the characteristics of employees' working conditions and work activities. We studied the biological, chemical, physical and psychological features of the work (infection risk, exposure to chemicals, noise, vibration, radiation, accident risk, monotony, stressors etc.). 10-points Likert scales were used to measure the extent of physical and mental stress at work (1 = not stressful; 10 = very stressful), the working atmosphere (1 = very bad, 10 = very good), and the extent of satisfaction with actions to preserve and promote employees' health (1 = not satisfied at all, 10 = completely satisfied).

Data analyses were performed using IBM SPSS 22.0. Descriptive and analytical statistics were applied (cross tabulation analysis with chi-square test, one-way ANOVA and Pearson correlations). Results were considered to be significant at $p < 0.05$.

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. 175/2012). Participation at the research was voluntary and anonymous.

RESULTS

Socio-demographic characteristics of the sample

The research sample composed of 33.0% male and 67.0% female participants. The mean age was 43.4 years, with the age range of 21–72 years. The respondents lived mainly in County Csongrád (95.0%), mainly within Szeged (74.7%); 13.8% commuted daily between their home and workplace. More than half of the sample was married or lived in partnership (69.8%), while 17.2% were single, 11.9% divorced and 1.1% were widow. 54.4% had one or two children, 15.3% had three or more children, while 30.3% had no children. 47.9% of the respondents had a college or university degree, of whom 40.6% had a Ph.D., and 5 people were D.Sc. also, while 9.5% had a secondary education only. Own financial status was characterized as good (18.0%) or very good (3.4%) by one-fifth of the respondents, 50.2% considered it to be satisfactory, 24.1% found it bad, and 4.2% thought it was very bad.

Working conditions

At the time of data acquisition participants – except for 5 people – were active workers (98.1%), 86.6% working as employees, while 11.5% worked in managerial positions.

More than one-fourth of respondents were exposed to noise, vibration, infection risk, and were working in the presence of chemicals, dust, and gas *(Figure 1)*. These exposures were more frequently characterized by employees of the health-care, than the non-health-care oriented faculties: infection risk (48.5% vs. 19.8%; $p < 0.001$); chemicals, dust, gas, smoke, steam (41.5% vs. 13.7%; $p < 0.001$); radiation (20.0% vs. 6.9%; $p = 0.002$); lifting heavy weights (e.g. patients), uncomfortable posture (17.7% vs. 7.6%; $p = 0.014$) and accident risk (30.8% vs. 14.5%; $p = 0.002$).

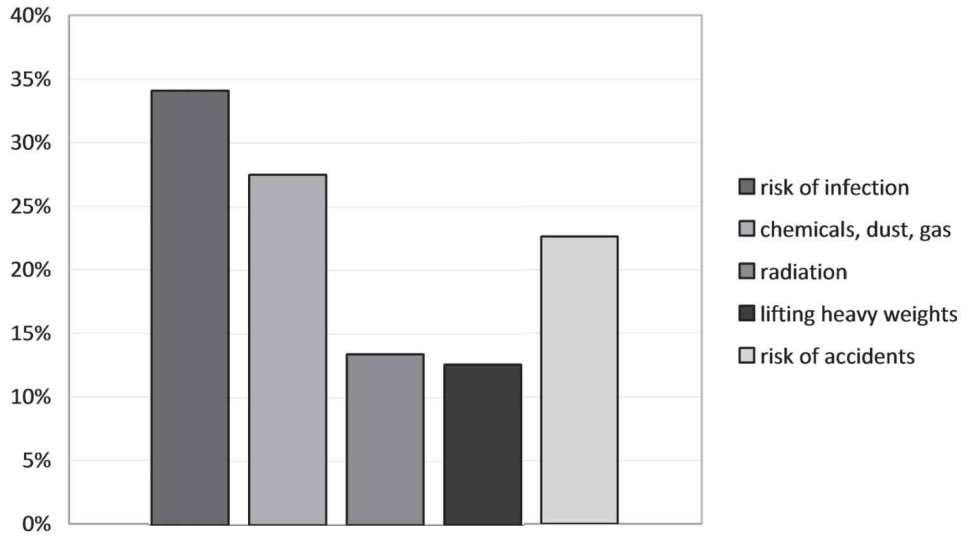

Figure 1. Frequency of health damaging working conditions

Within five years preceding the present survey there were several measures at the university which were characterized by the employees as improvements in their working conditions. These health protecting and health promoting measures obtained the average result of 4.50 ± 2.35 on a scale of ten. Such improvements were the separate dining rooms and possibilities to heat and store food (52.1%), installing an air conditioner (44.1%), ergonomic changes, such as providing furniture adjustable to the individual needs (32.2%), continuous upgrading of computers (29.9%), the possibility to have a break during work (24.1%), as well as ensuring a flexible working time that is compatible with family conditions (44.8%). There were a considerable number of employees (17.6%) who thought there were no such measures within the past five years.

Physical and mental characteristics of work

Employees worked at their workplace daily 7.79 ± 1.77 hours on average, while further 1.97 ± 1.58 hours were spent on doing overtime. Men spent significantly ($p = 0.015$) more time (2.32 ± 1.47 hours) overtime, than women (1.78 ± 1.61 hours). Those who were living in Szeged did an average of 2.06 ± 1.57 hours overtime, while commuters spent 1.39 ± 1.52 hours ($p = 0.031$) on extra work. There were no differences in doing overtime by family status and the number of children.

Respondents spent an average of 5.00 ± 2.55 hours daily in front of the computer. There was a negative correlation between age and computer use ($p = 0.008$), that is, the older someone was, the less time he/she spent with working on the computer (20–29 years old 5.68 ± 2.12 hours vs. above 60 years 3.64 ± 1.83 hours).

Respondents considered their work more mentally (average: 6.77 ± 2.31) than physically demanding (average: 4.18 ± 2.49). Physical and mental stress were in close connection ($r = 0.37$, $p < 0.01$), those, who found their work physically demanding considered it to be mentally demanding, too. The older the employee was, the more mentally demanding his/her work was considered to be ($r = -0.21$, $p < 0.01$). There were no gender differences in terms of physical and mental stress, and having children or being childless did not matter either. We haven't found differences between employees of health-care oriented and non-health-care oriented faculties, either. By the increase of working hours the level of mental ($r = 0.19$, $p < 0.01$)

and physical stress ($r = 0.15$, $p < 0.05$) became higher, as well as physical ($r = 0.23$, $p < 0.01$) and mental strain ($r = 0.14$, $p < 0.05$) was experienced. At the same time, the hours spent in front of the computer showed a negative correlation with the number of extra working hours ($r = -0.20$, $p < 0.01$), the more someone worked with a computer, the less overtime was reported.

Respondents declared that they had the possibility to utilize their knowledge and skills, and to make individual choices; their work required many independent ideas and inventiveness *(Figure 2.)*. It is worth noting however, that at the same time permanent stress, close deadlines and frequent overtime also characterized their work.

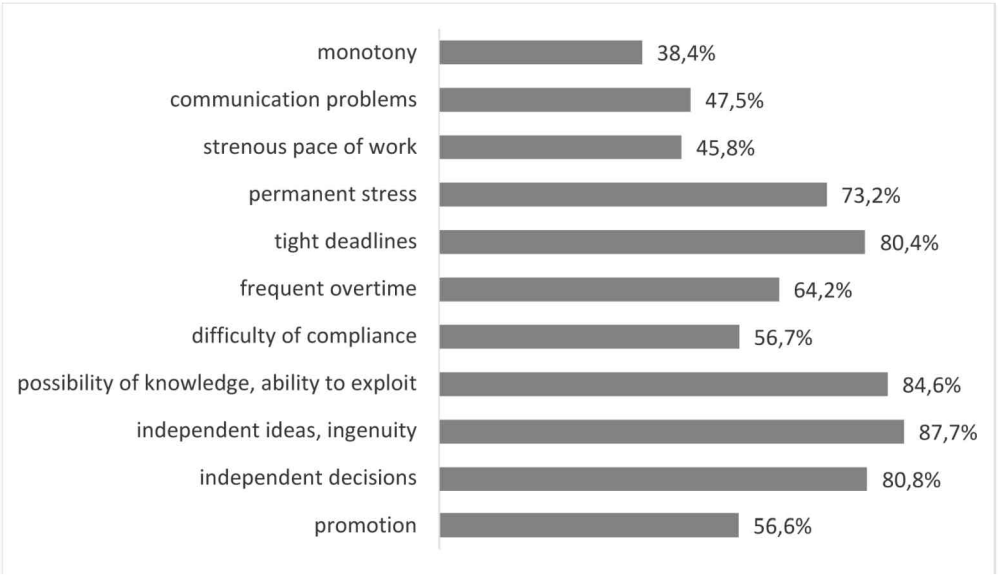

Figure 2. Psychological characteristics of working conditions

There were significant gender differences in the following specificities of work: the work required several independent ideas and inventiveness ($p = 0.028$); the possibility to make independent decisions ($p = 0.033$); promotion possibility ($p = 0.004$). These elements specified men's work mainly.

38.3% of respondents considered their work monotone; this opinion was closely connected to age ($p = 0.014$): young adults expressed this opinion significantly more often (60.9% of 20–29 year olds) than elder employees (26.3% of 60 and above year olds). There were significant differences according to financial status also ($p = 0.010$), 81,8% of those in very bad financial status, while only 22.2% of those in very good financial position considered monotony partly or completely characteristic.

There were significant differences by financial status in how close deadlines affected the perception of work ($p = 0.015$). Those in very good financial position were less characterized by close deadlines (55.6%), while those in a very bad financial situation (81.8%) thought close deadlines to be more characteristic to their work.

56.5% of respondents found the possibility to get a promotion at work characteristic. Men thought so to a higher extent than women (69.4% vs. 50.3%, $p = 004$). This opinion was considerably influenced by financial status ($p = 0.010$): those in a very bad or bad financial situation found their possibilities less favourable (45.5% and 39.7%) than those in a very good or good financial position (66.7% and 72.3%).

On a scale of ten work atmosphere was considered to be quite good (6.87 ± 2.02). Working conditions and mental strain negatively correlated, that is, the better someone thought work en-

vironment was, the less mentally demanding ($r = -0.17$, $p < 0.01$) his/her work was considered to be. There were no significant differences along the different demographical indices (gender, age, etc.).

Mainly moral and human appreciation characterized the university staff (55.9%), and the least appreciation came from the financial aspect (22.2%) *(Figure 3.)*.

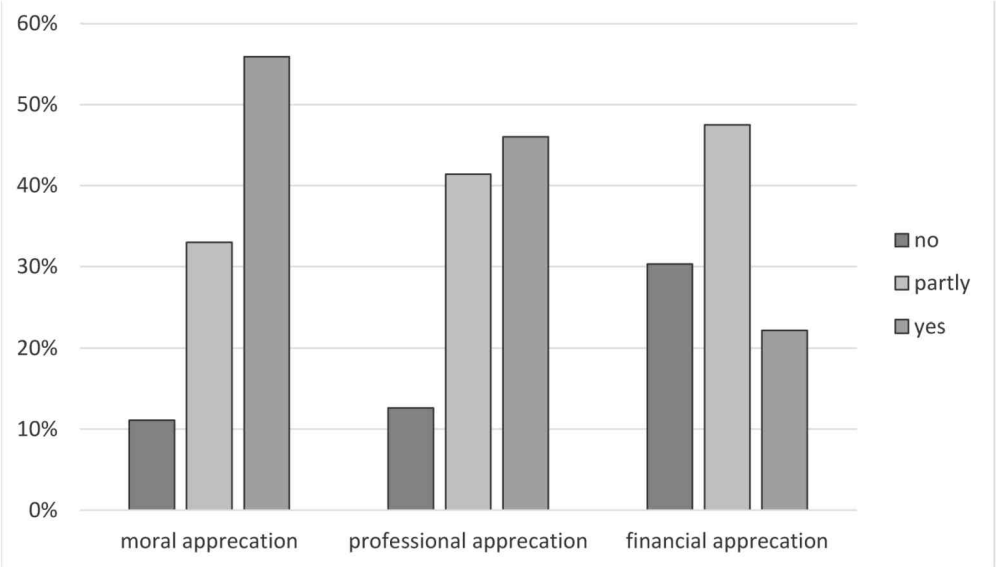

Figure 3. Self-perceived moral, professional and financial appreciation of employees at work

Financial appreciation was judged differently by men and women, while professional and moral appreciation was not. Men considered their financial status better than women ($p = 0.019$). Financial status and financial appreciation ($p < 0.001$), as well as professional appreciation ($p = 0.002$) were considerably interdependent. Those who considered their financial situation very good felt themselves financially more appreciated than those who considered it only adequate. Those who considered their financial situation bad or very bad did not feel financially appreciated at their work at all. Similar relationship was found between financial status and professional appreciation, too.

We have examined the opinions on working atmosphere by moral appreciation also. There was a clear relationship proven. According to feeling morally fully, partially or not appreciated a different opinion was expressed concerning the work atmosphere ($p < 0.001$). For example, those, who felt themselves morally, humanly completely appreciated evaluated the working atmosphere on average 3.85 points higher than those who felt no appreciation (7.82 vs. 3.97 points). The same relationship was found in case of professional appreciation and working atmosphere ($p < 0.001$). Those university employees who felt professionally more appreciated evaluated their work atmosphere on average 3.20 points higher than those who did not feel professionally appreciated (7.78 vs. 4.58 points).

Similar, but somewhat refined results were obtained by involving the financial appreciation variable. Groups formed according to financial appreciation saw their work atmosphere differently ($p < 0.001$). Those who felt themselves completely or only partially appreciated financially had the same view on their work atmosphere, there were no significant differences between the two groups. However, those missing financial appreciation considered their work atmosphere on average 1.70 and 1.78 points worse.

DISCUSSION

In our survey we have studied the working conditions of higher education staff. The mainly employee and a smaller number of managerial university staff worked under suitable working environment in general, except for those working at a health-care oriented area, who were more negative about their work conditions.

Employees referred to several measures carried out during the previous five years targeting at preserving and promoting health to create a more optimal working environment. Such measures were the introducing of breaks during work, the adjustable furniture, the upgrading of computer systems, etc. These however were considered to be not enough by some employees.

Employees dealt with their work 10–10.5 hours daily, part of which had to be done overtime. The pressure to work extra hours characterized men and local employees mainly. By the increase of working hours and extra work time the physical and mental strain was also higher. Those, who worked more extra hours considered their health status worse, which result was underlined by an international survey as well (Pisljar et al., 2011). The research by Pikó and Piczil (2007) carried out among health-care workers also showed more negative feelings towards own health by the increasing extent of extra work.

Today computer use at work is essential. Respondents worked with computers 5 hours daily on average; it was observed that by the increase in age less time was spent with computers. Borghans and ter Weel (2002) performed their age-related comparative study on German, English and American samples and found the same results, namely, the computer use of employees above the age of 49 decreases and they consider it less important.

Work was considered to be mentally demanding mainly, the stress appearing to be higher by age. Pikó and Piczil (2007) obtained similar results among health-care workers; by age there was an increase in the feeling of mental strain. Their work was basically characterized by permanent stress, close deadlines, and frequent overtime. A considerable part of them was continuously afraid of losing their job.

Positive result was that a considerable proportion of respondents found their working atmosphere suitable, with good workplace relationships.

There were differing views on financial, professional and moral, human appreciation. The feeling of professional appreciation was higher among the non-health-care oriented faculty employees, staff of faculties with a medical profile felt so only partly. Feeling financially appreciated was not significant among the university staff, only half of respondents considered their financial situation suitable, while almost one-third considered it definitely bad or very bad. Petőné's (2014) human capital research among higher education staff also highlighted the importance of being appreciated at work. As she states „The satisfaction of the teaching staff influences the quality of work and motivation, their further education plans, self-developing activities and their loyalty to the institute". There are more and more tasks required in higher education, and it is harder and harder to meet the requirements; work intensity, considering the decrease in the proportion of qualified staff compared to the increase in the number of students, is more and more demanding. Wages do not follow these changes; higher education employees work for nearly the same income for a long time. Unterbrink et al. (2007) showed that more than one-fifth (21.6%) of teachers make high efforts for successful work, while the financial reward is low. When efforts and rewards are not balanced, the result could be not only burnout, but it could also happen that employees have a second job to obtain the right rewarding.

In summary, it is advisable to carry on with the measures improving employees' infrastructural working conditions. It is also necessary to increase financial appreciation – to ensure proper income –, to prevent employees from establishing their financial security elsewhere, and preserve the high quality education of Hungarian universities, in particular at the University of Szeged.

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Health Behaviour of Higher Education Employees – Value-Transmitting Conduct of Professionals to their Students

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Abstract: *Workplaces and employees' health are closely connected. A healthy workforce would increase productivity, effectivity and efficiency which will benefit the employer in financial and moral terms as well. On the contrary, if employees experience stress, long working hours, bad managerial style, not safe working conditions that would lead to ill physical and mental health and poor lifestyle habits like lack of exercises, smoking, drinking and inadequate diets. Our research was carried out at faculties of the University of Szeged (n=261). Data acquisition was online, with the help of a self-completed questionnaire distributed through e-mail. Apart from basic socio-demographic data the questionnaire contained questions referring to employees' nutrition-, exercising-, sporting-, and leisure habits, visiting the doctor and their smoking- and alcohol consumption frequency. To sum all findings up, we can say that employees of the University of Szeged are concerned about their health and act for preserving and promoting it. They strive at creating a good well-being. Their health behaviour is acceptable and can mean a suitable example for the young adult generation.*

Keywords: health behaviour, higher education, lifestyle, health status

Introduction

Workplaces and employees' health are closely connected. A healthy workforce would increase productivity, effectivity and efficiency which will benefit the employer in financial and moral terms as well. On the contrary, if employees experience stress, long working hours, bad managerial style, not safe working conditions that would lead to ill physical and mental health and poor lifestyle habits like lack of exercises, smoking, drinking and inadequate diets (Sparks, Faragher & Cooper, 2001).

Kouvonen et al. (2005) found clear evidence for the association between work stress and smoking, regardless of age, level of education, occupational status, marital status or type of employment. The higher the work stress is, the higher the smoking intensity becomes. Fichtenberg and Glantz (2006) suggest that workplaces should be smoke free, as evidence shows smoke-free workplaces help smokers quit smoking as well as prevent non-smokers from the dangers of passive smoking.

We can find different health behaviour patterns along socio-economic (SES) differences. This effect is proven, among others, in case of leisure time physical activity (Lindström, Hanson & Östergren, 2001). Lindström et al. (2001) based their measure of SES on job title, tasks and position at work. In their studies, higher SES people were prevented from exercising by internal barriers (lack of motivation and leisure time) rather than by lack of money or existing disability reported by lower SES people. Linder (2009) researched the exercising behaviour of higher education employees. Employees reported on the mental, emotional appearance and weigh management benefits of exercising, while they experienced the disadvantages of lack of time and employer support, lack of health education, and home duties. The type of exercise higher education employees engaged in the most was walking.

The above differences might be due to differences in social capital, which according to Bourdieu's theory (1986) is also an indicator of our SES. High levels of social capital measured in dimensions like social support, social networks and participation is strongly associated with all components of health and health behaviour (Nieminen, 2015). Social participation is indicated by the number of social groups we belong to; social support is provided by all those people and groups we can rely on when we need help; social networks can promote our self-esteem and provide relief in stressful situations. According to Antonovsky's theory on the sense of coherence (in Nieminen, 2015) our social capital serves as a general resistance resource facilitating effective coping. Social capital and level of education go hand in hand. Ross and Wu (1995) stated, that education has a direct effect on health as well as indirect effects "*through work and economic conditions, social-psychological resources and healthy lifestyle*" (Ross & Wu, 1995:719). The well-educated tend to have greater control over their lifestyle, like less smoking and drinking, more exercising, more health check-ups. Li and Powdthavee (2015) though say that education does not necessarily lead to the avoidance of smoking, drinking and engaging in more preventive health checks.

Kulhánová et al. (2014) conducted a study involving 21 European countries and showed that higher educational attainment leads to

favourable trends in mortality, though the strength of this effect varies by countries. The effect of education on mortality was maximal in case of Hungarians. Increasing the level of education is a possible strategy to improve population health.

University as a workplace has all the prerequisites that can be utilized to become an effective intervention site: peer networks, time spent together with fellow workers (Hutchinson and Wilson, 2011), supporting academic environment, high level of education, knowledge and motivation. It is worth studying how a workplace like this affects its employees' health and health behaviour (Mátó, Nagymajtényi & Paulik, 2015).

We can also state, that higher education employees' health and health behaviour are also closely connected to their 'clients' health. As an educational setting, higher education has the social commitment of creating a sense of responsibility towards health, a capacity to act and a health-conscious behaviour among students. "*...health conscious persons are characterized as actively incorporating healthy behaviours in their daily routines, consistently being attentive to their health conditions, actively seeking and using health information from diverse sources, taking responsibility for their health, and being motivated to stay healthy*" (Hong, 2009:7). Gardner (2015) argues, that automatization is a key element for making health behaviour a habit pervading our everyday activities. Educators in higher education, with their preferably automatized health conscious behaviour, could be the sources of setting examples for the growing generations (Lumpkin, 2008), and they could be role models through respect, admiration and imitation (Paice et al., 2005). Role-models could be those individuals whose behaviour is an example or a model for others, who want to learn these (Filstad et al., 2007). Certain professional values, attitudes, forms of behaviour (Paice et al., 2005), success in sciences and professional career (Perry & Nixon, 2005) can also be examples. This way the health status and lifestyle of Higher Education professionals affect university students, hence they influence their students' health behaviour through their behaviour, habits and customs.

We have found it very important to study the health behaviour of employee working in higher education. Those, who work for the University of Szeged cooperate with young adults every day, aiding their effective knowledge acquisition, while at the same time forming students' health behaviour through the example of their own behaviour and habits. Higher education institutes this way have a direct influence on the lifestyle and health of their members. In the present paper we will study the range of health-influencing personal resources of Health Education professionals working at the University of Szeged.

Research methods and sample

Our research was carried out at faculties of the University of Szeged. Data acquisition was online, with the help of a self-completed questionnaire distributed through e-mail. Apart from basic socio-demographic data the questionnaire contained questions referring to employees' nutrition-,

exercising-, sporting-, and leisure habits, visiting the doctor and their smoking- and alcohol consumption frequency.

Sample size was 261 employees, from 11 faculties out of the 12 ones at the University of Szeged. The sample composed of 33.0% male and 67.0% female participants. The mean age was 43.4 years, with the age range of 21-72 years. The respondents lived mainly in County – Csongrád (95.0%), where the University is located. The rest lived in other counties, like Pest (2.3%), Bács-Kiskun (1.5%), Békés (0.8%) and Jász-Nagykun-Szolnok (0.4%). Szeged was their permanent residence in 74.7%, 13.8% commuted daily between their home and workplace, while 11.5% had Szeged as their temporary place of residence. Participants lived mainly in family houses (37.2%) or in apartment houses (42.9%). More, than half of the sample was married or lived in partnership (69.8%), while 17.2% were single, 11.9% divorced and 1.1% widow. 54.4% had one or two children, 15.3% had three or more children, while 30.3% had no children.

47.9% of the answerers had a college or university degree, 40.6%had a PhD, and 5 people (1.9%) were doctors of Academy. Secondary education alone was only of low frequency (9.5%).

At the time of data acquisition participants (except for 5 people) were active workers (98.1%), 86.6% working as underling employees, while 11.5% worked in managerial positions.

Data analyses were performed using IBM SPSS 22.0. Simple descriptive statistics (frequencies, means±SD), cross-tabulations with chi-square tests and Spearman correlations, t-probe were applied. Results were considered to be significant at $p<0.05$.

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. 175/2012). Participation at the research was voluntary and anonymous.

Results

Firstly, we will analyse the health behaviour habits of the complete sample. Then we will highlight at the connection between participants' satisfaction with their own fitness, health and looks with the importance of health and with their self-categorised health status.

Health behaviour habits

Participants considered the preservation and protection of their own health very important. On a scale of 10 – where 10 meant 'very important' – the mean choice was 9.2 (SD=1.17).

More than half of the sample (60.5%) reported they had a family member who was extremely conscious about the health of all members. This person was either the respondent (43.2%), or his/her spouse/partner (36.8%). In some cases, it was the child or the parent who considered health protection of family members as his/her job.

A considerable percentage of participants had knowledge about health, health protection and healthy behaviour (96.6%). 43.3% of the sample obtained this knowledge through their profession, 53.3% learnt them because they were interested in them. Health behaviour was further analysed along the following subdomains: health damaging behaviour, nutrition, exercising, leisure, holidays and screening.

Health damaging behaviour

It should be highlighted, that 13.9% of the complete sample was still smoking. 8.5% of the employees smoked daily. Almost one third of all the answerers (29.7%) smoked daily for a year long period, but they quitted. Those who once smoked and/or were still smoking started to smoke regularly at the average age of 18.5 years (SD=2.71).63,2% of those workers who were still regular smokers smoked 1-10 cigarettes a day, and some of them smoked 11-20 cigarettes a day.

13.9%of the complete sample did not drink alcohol, while 40.4% drank alcohol only at feasts or during visits. 16.6%drank 2-3 times a month, and 16.6% drank a small amount several times a month. Only 5 answerers (2.2%) reported on drinking a small amount of alcohol daily or several times a day.

Nutrition

It is preferential that most of the employees ate at least three times a day (Table 1). The ideal frequency of eating five times a day was very rare. They ate snacks rarely (47.9%) or several times a week (32.3%), but there were also some employees snacking every day (13.8%).

Table 1. Employees' eating frequency (%)

Eating	daily	several times a week	rarely	never
Breakfast	**79.3**	7.4	12.4	0.9
Brunch	19.4	17.1	**36.4**	27.2
Lunch	**74.7**	17.5	6.9	0.9
Afternoon snack	12.4	19.8	**42.4**	25.3
Dinner	**82.0**	12.9	4.1	0.9
Snacking when not hungry	13.8	**32.3**	**47.9**	6.0

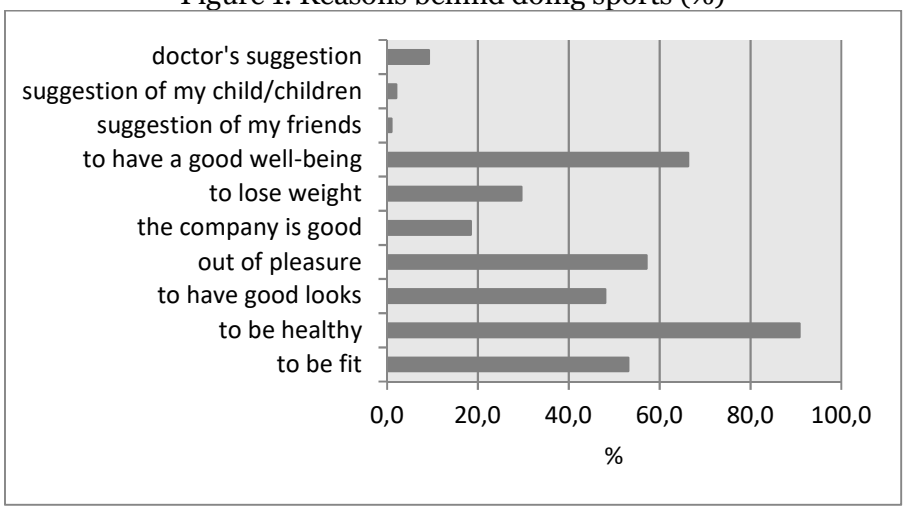
Apart from eating frequency the content of meals is also important. It is a positive result that drinking tap water and mineral water several times a day or daily was the most preferred way of hydration. When studying the frequency of eating food with carbohydrate content we found, that the answerers preferred white bread, though brown bread – which is a significant source of fibre – was also present in their nutrition at least couple of times a week. It is unfortunate that only a trifling proportion of the staff members ate raw vegetables (11.1%) and raw fruits (18.9%) several times a day. Milk with different fat content was consumed daily or several times a day only by 40.1% of the answerers. Respondents preferred lean

pork meat and skinless chicken meat to more greasy kinds of meat, and light cold meat to their fattier versions. Respondents cooked primarily with sunflower oil (63%), 22.7% used olive- or canola oil. 5.6% chose coconut fat or oil, 7.4% preferred animal fat, while only a few cases were reported when they cooked with margarine and butter. Part of healthy nutrition in adulthood is to prepare and eat our meals with less salt, and try to savour it with seasons. More than the half of respondents (61.8%) used salt only when cooking, while 32.7% preferred less salty or unsalted food, meal. Only a low percent of respondents (5.5%) ate salty or put extra salt into the ready meal. Most of the respondents did not choose an alternative form of nutrition (93.1%). There were some semi-vegetarians (2.8%) and some applying reform nutrition (2.3%). Only 6.9% of respondents followed a fashionable diet for losing weight. 12 of them (80.0%) ate vitamin and mineral products regularly. When studying the whole sample, 64.5% ate vitamin and/or mineral products regularly. Those who ate these products chose primarily combined vitamin and mineral products (40.1%), and only vitamin products on the second place (21.2%).

Exercising

78.2% of respondents performed some kinds of physical exercises. Into physical exercise we included active walking, jogging and cycling performed at least once a week also. Respondents performed exercises 1-2 days a week (33.7%), 3-4 days a week (22.1%), 5 days a week (20.0%), or daily (24.2%). 44.8% of respondents were doing sports. 12.7% of the asked workers did not perform any exercises or sports. Sports were performed generally several times a week (79.4%), often twice a week (32.0%), or three-four times (30.9%). The reason behind doing sports was not because their friends or child/children suggested it (Figure 1), but primarily because of becoming healthy (90.8%), and secondly because of creating a good well-being (66.3%). A characteristic reason was to do sports out of pleasure (57.1%) or to become fit (53.1%) or to look good (48.0%). In nine cases (9.2%) the doctor suggested the respondent to do sports.

Figure 1. Reasons behind doing sports (%)



Leisure time

Respondent members of the university staff did work related tasks at home or in their workplaces, an average of 2.5 hours even on an ordinary day off. They slept 8 hours on an ordinary day off, spent 6-6.5 hours working on work-related plus household chores, and 4-4.5 hours with active leisure. The number of hours spent on leisure activities was favourable among the respondents.

Respondents spent their leisure time mainly with reading, discussions, visiting others, cooking and baking, walking, watching TV, listening to music, going for excursions, gardening or doing sports (Table 2).

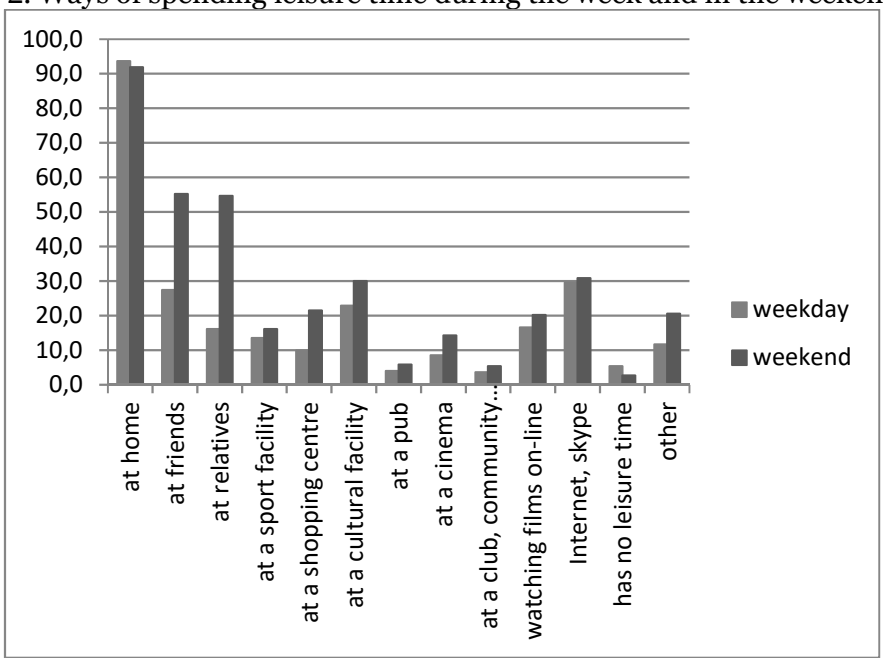
Table 2. Activities the university staff spend their leisure time with (%)

Activity	%	Activity	%	Activity	%
visit places of amusement	9.0	sport	28.7	reading	73.1
listening to music	37.2	gardening	36.3	cooking, baking	54.3
playing music	9.0	do it yourself	11.7	walking	48.4
watching TV	43.5	handcraft	13.9	excursion	37.2
cinema	13.0	chess, cards, bridge, board games	10.3	hunting	1.4
theatre, concert	20.6	billiard, bowling	2.7	grandchild	1.4
discussions, visiting	62.8	other games	13.5	language learning	1.4

In an average weekday, they had almost 2 hours (mean=1.84, SD=1.29) to spend on leisure activities. Only 5.4% of respondents declared they did not have time for leisure during weekdays. This weekday leisure time was spent mainly at home, or with friends, or in cultural facilities, and there were also some employees visiting relatives or going to sport facilities (Figure 2). Almost one-third of respondents spent this time with browsing the Internet, skype or watching films on-line. There were only a few people who spent their leisure time in a club or in a community centre during weekdays.

There were also some staff members (2.7%) who did not have any time for leisure during weekends. During the weekends leisure time was spent mostly with friends and relatives, or at cultural facilities, shopping centres, or cinema.

Figure 2. Ways of spending leisure time during the week and in the weekends (%)



Holiday

During the last 3 years, as a leisure activity, almost half of university staff respondents spent their holidays inland three or more times, while spending holidays abroad characterised only one-third of them (Table 3). Approximately 40% of respondents had not been on a holiday abroad at all during the past 3 years.

Table 3. The frequency of spending holidays inland and abroad during the past 3 years (%)

Frequency	Inland%	Abroad %
never	16.6	38.6
one time	14.3	22.4
two times	22.9	11.2
three or more times	46.2	27.8
Total	100.0	100.0

Those, who were not participating in an inland holiday in the past 3 years reported almost in all cases no holiday abroad as well (Table 4). However, almost the half of those who had the opportunity to spend their holiday inland three or more times could go for a holiday abroad with a similar frequency as well (Table 4).

Table 4. Number of holidays in the past 3 years (number of people)

		Number of foreign holidays in the past 3 years				
		none	one	two	three or more	total
Number of inland holidays in the past 3 years	none	**26**	5	2	4	37
	one	16	8	3	5	32
	two	20	19	5	7	51
	three or more	24	18	15	**46**	103
	Total	86	50	25	62	223

Participation in screening

Women went to breast screening in every two years (42.4%), or less (34.0%), participation in cervix screening was mainly of yearly frequency (64.5%). There was a considerable number of women who participated in cervix screening with less than a two years frequency (18.7%). The male respondents generally went for prostate cancer screening with a less than two years frequency (84.9%). The respondents participated in skin cancer (62.9%) and mouth cancer (77.5%) screenings less than every two years. However, there were respondents who went for a skin cancer screening in every year (21.8%) or in every two years (15.2%). In general, it was true, that women were more conscious about their own health than the male ones, and considered the importance of their health higher than their male co-workers. There were also significant differences between men and women concerning participation in colorectal screening (χ^2=8.54, p=0.04). Women participated mainly with a less than two years frequency, while men did the same with a similar frequency (91.4%), and showed a yearly participation (3.5%).

Correlation study of health behaviour and subjective health status

Respondents considered their own health status quite good on a scale of 5 (mean=3.7, SD=0.80). There was a considerable correlation between the subjective judgement of one's own health status and the extent he or she considered own health important (Table 5). Those, who were more satisfied with their fitness considered their health more important. Those respondents, who were more satisfied with their fitness, looks and health considered their own health status better than those less satisfied ones (Table 5).

Table 5. The correlation between satisfaction and health

	Importance of own health	Subjective opinion about own health status
Importance of own health	1.00	**0.26**
Subjective opinion about own health status	**0.26**	1.00
Satisfaction with own health	0.23	**0.70**
Satisfaction with own fitness	0.20	**0.55**
Satisfaction with looks	0.23	**0.46**

The table contains the Spearman rho values. Each data in the table indicate a significant correlation on level p<0.01.

Analysis of the connection between place of spending leisure time and own judgement of health status revealed, that those, who spent their leisure time in sport facilities (t=3.56, p<0.01), or with friends (t=3.06, p<0.01) evaluated their health status higher than those who spent their leisure time at home or in shopping centres.

Summary and conclusions

Our research data revealed that health was very important for the employees of the University of Szeged, especially for women workers. With only a few exceptions they all had knowledge concerning health, health protection and healthy lifestyle. This knowledge they acquired out of interest or possessed due to their profession. Health knowledge and consciousness was also reflected in their actual health behaviour, providing an excellent example for their students.

Employees' health behaviour can also be an example, as the rate of smokers is low and alcohol consumption is also mild. It could also be highlighted, that the observed employees drink tap water and mineral water mainly, eat less fatty meat, do not use excessive salting and prefer mixed nutrition. They spend their free time usefully, with nurturing their social bonds, as well as with engaging in cultural and physical activities.

Some aspects of their nutrition, however, needs improvement. Such aspects are the right amount of eating during the day, the preference of whole grain bread to the white one, and the higher frequency of eating raw vegetables and fruits.

To sum all findings up, we can say that employees of the University of Szeged are concerned about their health and act for preserving and promoting it. They strive at creating a good well-being. Their health behaviour is acceptable and can mean a suitable example for the young adult generation.

By a slight increase in the currently small financial appreciation of the HE staffs a considerable improvement could be achieved in their nutrition habits, access to travelling for a holiday or in their leisure habits.

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

DEJAVNIKI PSIHOSOCIALNEGA 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
Component 1: Job demands			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		
Component 2: Autonomy			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		
Component 3: Biological, chemical agents			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		
Component 4: Negative social interactions			10.908	0.739
violent behaviour of colleagues	11.5	0.823		
discrimination	12.3	0.806		
bullying	17.2	0.710		
Component 5: Physical agents			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		Job demands (1)		Autonomy (2)		Negative social interactions (4)	
	n (%)	Mean rank	P-value*	Mean rank	P-value*	Mean rank	P-value*
Relationship to colleagues			0.099		0.052		0.000[1]
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	
Relationship to superiors			0.018		0.002[2]		0.004[3]
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	
Financial appreciation			0.005[4]		0.001[5]		0.022[6]
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	
Professional appreciation			0.000[7]		0.000[8]		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	
Moral appreciation			0.000[9]		0.001[10]		0.000[11]
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.
[1] Significant results of post hoc testing (p-value): A and D (0.006); B and D (0.012); A and C (0.019)
[2] Significant results of post hoc testing (p-value): A and D (0.006); A and B (0.040)
[3] Significant results of post hoc testing (p-value): A and D (0.010); B and D (0.007)
[4] Significant results of post hoc testing (p-value): A and C (0.003)
[5] Significant results of post hoc testing (p-value): A and C (0.002); C and B (0.012)
[6] Significant results of post hoc testing (p-value): A and C (0.019)
[7] Significant results of post hoc testing (p-value): A and C (0.043); A and B (0.000)
[8] Significant results of post hoc testing (p-value): A and C (0.000); A and B (0.000)
[9] Significant results of post hoc testing (p-value): A and B (0.002); A and C (0.005)
[10] Significant results of post hoc testing (p-value): A and C (0.001)
[11] 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

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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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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Védőoltásokhoz való hozzáállás egyetemi hallgatók egy csoportjában

Attitudes towards vaccinations among a group of university students

Szerző: Mátó Veronika
Kulcsszavak: védőoltás; oltási attitűd; egészségkommunikáció
Keywords: vaccination; vaccination attitude; health communication

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Összefoglaló

Bevezetés: Az egészség megőrzésének fontos része a védőoltások alkalmazása, olykor azonban mégis elbizonytalanodunk, felmerül bennünk a biztonságosság kérdése. Napjainkban a félelemérzet a fertőzés súlyosabb következményeitől már nem is kap akkora hangsúlyt, mint gondolnánk. A vizsgálat elsődleges célja a Szegedi Tudományegyetem Juhász Gyula Pedagógusképző Karon kiválasztott hallgatók szemléletének megismerése a fertőzések védőoltásokkal történő megelőzésével kapcsolatban.

Módszertan: A vizsgálati célcsoportban (N = 93) online, anonim kérdőív kitöltésével gyűjtöttünk információt a 2014–2019-ben felvett védőoltásokról, az ajánlott védőoltásokkal kapcsolatos tájékozódási módokról és az oltási attitűdről. Leíró és elemző (khí^2-próba) statisztikai módszerekkel elemeztük az eredményeket.

Eredmények: Az ajánlott védőoltások felvétele nem jellemző a vizsgált célcsoport körében, a hallgatók több mint fele nem is javasolná másoknak azok beadatását. Úgy vélik, hogy vannak más eredményes módszerek is, amelyekkel védekezni lehet a fertőző betegségekkel szemben. A döntésüket arról, hogy beoltassák-e magukat egy vakcinával, több szempont is befolyásolhatja. Ilyen például az oltás költsége, az oltás szükségszerűségének érzete, az oltással szembeni bizalmatlanság, de a betegségtől való félelem is. A vizsgálatba bevont személyek körében előfordul a védőoltásokkal szembeni helytelen információ birtoklása. Az influenza elleni oltóanyag felvétele a férfiak körében volt jellemzőbb. Az ajánlott védőoltásokkal kapcsolatos információk gyűjtése a posztgraduális és a szakvizsgaképzésben résztvevők esetén volt jelentősebb. Az információk forrása elsősorban a családorvos, de a szakvizsgaképzés résztvevői körében ugyanolyan lényeges valamely családtag véleménye, illetve a médiatartalmak is. A vizsgálatba bevont személyek kevesebb mint egyötöde tudott megbízható internetes felületet megnevezni tájékozódás céljából.

Következtetések: A hallgatók bizalmatlanságát, helytelen információit a védőoltásokkal kapcsolatban mérsékelni szükséges, és kritikus gondolkodásra ösztönözni őket, hiszen a véleményformáló szerepük meghatározó. Egészségkommunikációjuk, tájékozottságuk, tudásuk által képesek a környezetükben lévő emberek oltásokra vonatkozó attitűdjét kedvező irányba befolyásolni, továbbá az azokkal kapcsolatos tévhiteket eloszlatni.

Summary

Background: Vaccination is an important part of maintaining good health. Sometimes, however, we have doubts. The issue of safety crops up. The fear of the more serious consequences caused by infections is no longer getting much emphasis these days. The primary aim of the study is to learn about the attitude of selected students at the Juhász Gyula Faculty of Education, University of Szeged, in relation to the prevention of infections with vaccines.

Methodology: An online, anonymous questionnaire was administered in the target group (N = 93). The questions focused on vaccinations received in the period of 2014–2019, sources of information

about recommended vaccines, and vaccination attitude. Descriptive and analytical (chi-square test) statistical methods were applied for data analysis.
Results: The uptake of recommended vaccinations is not typical among the examined target group; more than half of the students would not even recommend their uptake. They believe that there are other effective ways to control infectious diseases. Their decision to take up vaccinations can be influenced by several factors. Some of these are, the cost of vaccination, a sense of necessity regarding vaccination, distrust towards vaccination, and the fear of disease. Some people involved in the study have incorrect information about vaccinations. Influenza vaccine uptake was more common among men. Collecting information on recommended vaccinations was more significant among students in the postgraduate and in the teachers' special exam training. The source of information is primarily the family doctor, but among those in the special exam training, a family member is just as important a source as the media. Less than one-fifth of those questioned were able to name a reliable Internet source for reference.
Conclusions: It is necessary to address students' distrust and incorrect information about vaccinations and encourage them to think critically, as their role is decisive. Through their health communication, information and knowledge, they are able to positively influence the attitudes of people in their environment towards vaccinations, and to dispel misconceptions about them.

BEVEZETÉS

Az egészség minden ember számára fontos érték. Az egészség megőrzéséhez hozzátartozik a védőoltások alkalmazása is, hogy egyes fertőzések kialakulását megelőzzük. Bizonyos életkorban és fokozott fertőzésveszély esetén kötelező védőoltásokon kívül egyéb védőoltások alkalmazása is javasolt.

100%-os védelmet nem eredményez minden védőoltás (Elek, 2012; Horváth, 2012), de csökkenti a megbetegedés kialakulásának esélyét (Horváth, 2012). Napjainkban tétovázunk egy-egy oltás beadatását illetően, aggódunk, milyen káros mellékhatásai lehetnek az adott oltóanyagnak, megkérdőjeleződik a biztonságossága (Inhoff, Gyergyák, Illyés-Kovács, Lukács, & Turcsán, 2020; Narayanan, Jayaraman, & Gopichandran, 2018). Minderre a 21. században nagyobb hangsúlyt fektetünk, háttérbe szorítva az adott védőoltással megelőzhető betegségtől való félelmünket (Elek, 2012). Tudjuk, hogy a védőoltásoknak vannak kockázatai, de ez a kockázat kisebb, mint egy súlyosabb fertőző betegség hatása az emberi szervezetre, vagy a megbetegedés esetén kialakuló szövődmény (Országos Epidemiológiai Központ, 2014). Hazai háziorvosok, házi gyermekorvosok és védőnők körében is tapasztalták egy 2017-es vizsgálat során a vakcinák biztonságosságának megkérdőjelezését, elsősorban az ajánlott oltások esetén (Kun, Benedek, & Mészner, 2019).

Előfordul, hogy a védőoltásokkal kapcsolatban hiányos vagy helytelen információkat birtoklunk, amelynek eredménye, hogy elutasítjuk azok beadatását. Éppen ezért lényeges, hogy tudományosan alátámasztott, megbízható információkkal rendelkezzünk (Elek, 2012). Itt fontos megjegyezni a társadalmi felelősségvállalás szerepét az emberek egészségének megőrzése terén (Tarkó, 2021). Ha a társadalom tagjai a szakértelemmel szembeni bizalmatlanságukat hangoztatják — figyelmen kívül hagyva, hogy egy-egy félelem a tudományos bizonyítékok segítségével cáfolható (Kata, 2010) —, sokakban kétség, bizonytalanság merül fel (Elek, 2012), aminek következtében negatív ítéletet alkothatnak, és nem hoznak megfelelő döntéseket.

Panayiota Kendeou, a Minnesotai Egyetem neveléspszichológusa szerint a meggyőződés által azokat az információkat fogadja el az egyén, amelyekkel egyetért. A többi adat a figyelmén kívülre kerül. A pszichológus kiemeli, hogy a figyelem nagyon lényeges, amit a szorongás vagy a félelem jelentősen korlátoz. Ennek eredménye, hogy az ember nem tud kritikusan gondolkodni, így a figyelmét elkerüli például az, hogy honnan származik az információ (Witkowski, 2018). Vagyis az emberek azokat az üzeneteket fogadják be, amelyek megerősítik addigi vélekedéseiket (Meppelink, Smit, Fransen, & Diviani, 2019).

Helytelen azt gondolni, hogy a védőoltások toxikus hatással vannak az emberi szervezetre (Goda, 2020). Az sem megfelelő álláspont, ha egy védőoltás beadatását azért ellenezzük, mert jelenleg nem fordul elő vagy nem gyakori az adott betegség (Narayanan et al., 2018). Ha az átoltottság egy bizonyos szint alá csökken, akkor megszűnik a nyájimmunitás és a betegség újra megjelenik (Goda, 2020). Általános, hogy azzal is magyarázzuk az adott védőoltás beadatásának elutasítását, hogy eddig nem kaptuk el a kórt. Ez azonban nem jelenti azt, hogy a későbbiekben sem kaphatjuk el, ugyanakkor nincsen meg az ezzel kapcsolatos félelemérzetünk. Ha az immunrendszerünk valóban erős, mégis beadatunk egy védőoltást, azzal óvjuk környezetünkben azokat az embereket, akik esetleg gyenge immunrendszerrel rendelkeznek és / vagy az idős korosztály tagjai (Goda, 2020). A kötelező védőoltások beadatása megelőzés céljából szükséges az adott életkorban, hiszen anélkül a fertőző betegség megjelenhet, annak lefolyása veszélyes is lehet az egyénre és környezetére nézve. Az ajánlott védőoltás beadása a megelőzés szempontjából fontos. A Minnesotai Egyetem neveléspszichológusa szerint az emberek tévhitei az oltásokkal kapcsolatosan sohasem fognak eltűnni, de talán háttérbe szoríthatók, ha kritikusan gondolkodnak, és megfelelő bizonyítékokat keresnek a helytelen érvek elvetéséhez (Witkowski, 2018).

A Los Angeles-i Kalifornia Egyetem kutatói felhívják a figyelmet arra, hogy az oltások alkalmazásával kapcsolatban hangsúlyozni kell, milyen következményei lehetnek annak, ha az adott oltás elmarad (Illyés, 2016). A Stanford Egyetem tudósai és munka-társai is megfigyelték, hogy az adott betegség kockázatának megismertetésével pozitív attitűdbeli változást érhetnek el, vagyis a félelem képes az oltásellenes magatartást megváltoztatni (Witkowski, 2018).

A felsőoktatásban egészségtudományi területen dolgozó szakemberként szükségesnek tartjuk megismerni, milyen szemléletet képviselnek a hallgatók a megelőzés vonatkozásában a fertőző megbetegedések esetén, e téren mi jellemezheti az egészségkommunikációjukat környezetük felé. Ezáltal információkat kaphatunk arra vonatkozóan is, hogy a hallgatók mennyire tudatosak a saját egészségi állapotuk megőrzésével kapcsolatban. Vajon beszélhetünk-e körükben az egészségtudatosság meglétéről, felelősségteljes egészségmagatartásról a védőoltásokkal kapcsolatban?

A vizsgálat elsődleges célja a Szegedi Tudományegyetem Juhász Gyula Pedagógusképző Kar Alkalmazott Egészségtudományi és Környezeti Nevelés Intézetben tanulmányokat folytató hallgatók vakcinációhoz való hozzáállásának felmérése volt, elsősorban az ajánlott védőoltásokra (pl.: az influenzavírus, a humán papillomavírus (HPV), a bárányhimlő elleni védőoltás) vonatkozóan. A 2018. július 31. után született gyermekek esetén már a kötelező oltások között szerepel a bárányhimlő elleni vakcina (Nemzeti Népegészségügyi Központ, 2021), míg a vizsgálati célcsoport körében az ajánlott védőoltások közé tartozik.

MÓDSZERTAN

A vizsgálatra a 2020–2021-es tanév I. félévében került sor. Az adatok gyűjtése saját szerkesztésű online kérdőívvel történt, kényelmi mintavételt alkalmazva. A részvétel önkéntes alapon, az adatok feldolgozása anonim módon valósult meg. Az adatelemzést az IBM SPSS 25.0 programmal végeztük. Az adatok leíró és elemző statisztikai módszerekkel (kereszttábla-elemzés, khí^2-próba) kerültek kiértékelésre.

Az alapvető szociodemográfiai adatokon (nem, életkor, szak) túl, a célcsoport által beadatott vakcinákra, az ajánlott védőoltásokkal kapcsolatos tájékozódásuk módjaira, továbbá az ajánlott oltásokra vonatkozó szemléletükre, attitűdjükre kérdeztünk rá. A kérdőív végén található állításokkal való egyetértésük mértékét négyfokú skálán fejezték ki a vizsgálatba bevont személyek, ahol az 1 – az egyáltalán nem értek vele egyet, a 2 – az inkább nem értek vele egyet, a 3 – az inkább egyetértek vele és a 4 – a teljes mértékben egyetértek vele értékeket jelölte. Továbbá néhány állítás esetén ugyancsak négyfokú skála segítségével adták meg, hogy menynyire jellemző rájuk az adott állítás. Ez utóbbi esetben az 1 – az egyáltalán nem jellemző, a 2 - az inkább nem jellemző, a 3 – az inkább jellemző és a 4 – a teljes mértékben jellemző kategóriát jelentette.

EREDMÉNYEK

A 93 válaszadó 68,8%-a (n = 64) volt nő. A kitöltők átlagéletkora 30 év (életkorátlag: 29,53 év), a legfiatalabb hallgató 19 éves, a legidősebb személy 54 éves volt. A sport- és rekreációszervezés alapszak (37,6%, n = 35), az edző alapszak (16,1%, n = 15), a mentálhigiénés közösség- és kapcsolatépítő mesterképzési szak (26,9%, n = 25), az egészségfejlesztő mentálhigiéné szakirányú továbbképzési szak (11,8%, n = 11) és az egészségfejlesztő mentálhigiénikus pedagógus szakvizsgára felkészítő szakirányú továbbképzési szak (7,5%, n = 7) hallgatói adtak információt a vakcinációhoz való hozzáállásukról.

1. táblázat: A vizsgált célcsoport által beadatott védőoltások 2014–2019 között (N=93)

	2014–2018 között fő (%)	2019-es évben fő (%)
Védőoltást beadatottak száma	23 (24,7)	5 (5,4)
Beadatott védőoltás típusa		
Tetanusz	5 (5,4)	1 (1,1)
Influenza elleni védőoltás	7 (7,5)	4 (4,3)
HPV elleni védőoltás	7 (7,5)	-
Agyhártyagyulladás elleni védőoltás	3 (3,2)	-
MMR oltóanyag	1 (1,1)	-
Hepatitis A, B elleni védőoltás	1 (1,1)	-
Nem megnevezett a beadatott védőoltás	2 (2,2)	-

Forrás: saját szerkesztés

A 2014–2019 között védőoltást felvettek átlagéletkora 31 év (átlagéletkor: 30,88 év), 70,8%-a (n = 17) nő. [1. táblázat] A vizsgálati csoportban 2019-ben a 37 évnél idősebbek (átlagéletkoruk 45 év) oltatták be magukat az influenza elleni védőoltással. Három személy 2019-ben, és az azt megelőző 5 év mindegyikében beoltatta magát influenza elleni oltóanyaggal. Három személy (3,2%) az agyhártyagyulladás elleni vakcinával is beoltatta magát a HPV elleni oltóanyag felvétele mellett.

Szignifikáns ($\chi 2(1) = 5{,}738$, 1, $p < 0{,}05$), gyenge összefüggés (Cramér-féle V = 0,248*) tapasztalható a hallgató neme és az influenza ellen ajánlott védőoltás felvétele között. Az influenza elleni vakcina felvétele (31,2%, n = 29 fő) a férfiak körében volt jellemzőbb (48,3%), a nők kevesebb mint egynegyede (23,4%-a) oltatja be magát.

Kirándulás előtt kullancsencephalitis ellen védőoltást 8,6% (n = 8) adatott már be magának. A vizsgálatba bevont személyek 30,1%-ának (n = 28) van gyermeke, ezen hallgatók 82,1%-a (n = 23) adatott már be a gyermekének ajánlott védőoltást (influenza, rotavírus, HPV ellen stb.).
Az oltási attitűdöt nagymértékben befolyásolta a HPV elleni vakcina esetén az ahhoz való ingyenes hozzáférés. A válaszadók 57,0%-a (n = 53) beoltatná magát a HPV elleni oltóanyaggal, ha az ingyenes lenne.

Azok, akik nem adatnak be maguknak influenza elleni vakcinát (68,8%, n = 64 fő), többségében (79,7%, n = 51) indokolták is a nemleges válaszukat.

Elsősorban azért nem oltatják be magukat az influenza elleni védőoltással, mert nem látják annak szükségét (39,2%). [2. táblázat] A válaszadók közel egynegyede (23,5%) bizalmatlan az oltóanyaggal szemben, néhány esetben saját vagy mások negatív tapasztalata miatt.

Az összes válaszadó fele (53,8%, n = 50) az ajánlott védőoltásokról különböző forrásokból tájékozódik.

Szignifikáns ($\chi^2(4) = 21{,}454$, $p < 0{,}001$), közepes erősségű az összefüggés (Cramér-féle V=0,480) aközött, hogy a hallgató melyik képzésben tanul, és hogy gyűjt-e az ajánlott védőoltásokkal kapcsolatban információt. Az egészségfejlesztő mentálhigiénikus pedagógus szakvizsgára felkészítő szakon minden hallgató (100,0%), míg az egészségfejlesztő mentálhigiéné szakon a

többség (90,9%) tájékozódik az ajánlott védőoltásokról. A mentálhigiénés közösség- és kapcsolatépítő szakon (60,0%), valamint az edző szakon tanuló hallgatók több mint fele (53,3%) gyűjt ilyen irányú információkat. A sport- és rekreációszervező szakos hallgatók számára kevésbé lényegesek ezek az információk, az ajánlott oltásokról mindössze 28,6%-uk tájékozódik.

2. táblázat: Az influenza elleni védőoltás elutasításának indoka, hallgatói saját válaszok (n = 51)

Hallgatók által megfogalmazott indok	Összesen fő (%)
„Nem tartom indokoltnak, hogy beadassam."	20 (39,2)
„Nem bízom az oltóanyagban, nem hiszek benne."	12 (23,5)
„Erős az immunrendszerem, vagy törekszem annak erősítésére."	8 (15,7)
„Eddig sem vettem fel, ezután sem fogom."	3 (5,9)
„Még sosem voltam influenzás."	2 (3,9)
„Másként védekezek ellene."	1 (2,0)
„Az oltóanyagban lévő káros anyaggal nem szeretném szervezetemet terhelni."	1 (2,0)
„Az oltóanyaggal nem szeretném legyengíteni az immunrendszeremet."	1 (2,0)
„Félek az injekciós tűtől."	1 (2,0)
„Nem szeretném felvenni."	1 (2,0)
„Nem tudom, hogyan adathatnám be magamnak."	1 (2,0)

Forrás: saját szerkesztés

3. táblázat: Az ajánlott védőoltással kapcsolatos tájékozódás forrása (n = 50)

Tájékozódási forrás	Összesen fő (%)
Családorvos, házi gyermekorvos	41 (82,0)
Valamely családtag	24 (48,0)
Internet	21 (42,0)
Barátok, ismerősök	16 (32,0)
Védőnő	13 (26,0)
Média	12 (24,0)
Szakmai ajánlás figyelembe vétele	11 (22,0)
Gyógyszerész	2 (4,0)
Orvosi szaklapok olvasása	2 (4,0)
Szakorvosi vélemény	1 (2,0)

Forrás: saját szerkesztés

A vizsgálat során tájékozódási forrásként egy személy több forrást is megjelölhetett. [3. táblázat]

Valamennyi szak hallgatóinak elsődleges információforrása az ajánlott védőoltásokkal kapcsolatban a családorvos személye. Az egészségfejlesztő mentálhigiénikus pedagógus szakvizsgára felkészítő továbbképzési szak hallgatói körében nem elsődleges a családorvos személye (57,1%), náluk a családtag is ugyanolyan jelentős (57,1%) információforrás, ahogy a média is (57,1%). A média, mint információforrás, ezen szak hallgatói körében a legjellemzőbb. Az egészségfejlesztő mentálhigiéné szakos hallgatók körében (20,0%) nem jelentős tájékozódási forrás valamely családtag személye, ellenben a többi szak hallgatói számára jelentősége nagyobb. Az internet kevésbé jellemző tájékozódási forrás az ajánlott védőoltásokról a sport- és rekreációszervező szakosok körében, mint a többi szak képviselőinél.

A hallgatók mindössze 14,0%-a (n = 13) ismer olyan internetes oldalt / oldalakat, ahol védőoltásokról tájékozódhat. Az említett oldalak között szerepel az antsz.hu (38,5%, n = 5), az nnk.gov.hu (Nemzeti Népegészségügyi Központ) oldal (23,1%, n = 3), a semmelweis.hu (15,4%, n = 2), a medicalonline.hu, az immed.hu, a PubMed és a Házi Patika internetes oldala, valamint a webbeteg.hu, ez utóbbiak egy-egy esetben kerültek megemlítésre.

A hallgató tanulmányai és a védőoltásokkal kapcsolatos internetes oldalak ismerete között szignifikáns ($\chi^2(4) = 17{,}411$, $p < 0{,}05$), közepesen erős összefüggés (Cramér-féle V = 0,433) van. Elsősorban az egészségfejlesztő mentálhigiéné szakos hallgatók (45,5%) tudtak internetes oldalt, oldalakat megnevezni, ahonnan tájékozódni lehet ajánlott védőoltásokkal kapcsolatban. Az egészségfejlesztő mentálhigiéné szakon tanuló hallgatók hat különböző internetes felületet neveztek meg, míg a mentálhigiénés közösség- és kapcsolatépítő szakosok négyet, az edzők és a szakvizsgát adó képzésben részt vevő hallgatók pedig mindössze egy-egy felületet.

A válaszadók 49,5%-a (n = 46) úgy vélte, tudja, hogy külföldre utazás előtt hova fordulhat információért védőoltással kapcsolatban. Főként az egészségfejlesztő mentálhigiénikus pedagógus szakvizsgát adó képzésben részt vevő (85,7%) és az egészségfejlesztő mentálhigiénikus képzésben részt vevő (81,8%) hallgatók tudják, hogy a védőoltásra vonatkozó információk honnan szerezhetők be külföldre utazás előtt. A mentálhigiénés közösség- és kapcsolatépítő szakos hallgatók fele (52,0%), az edző szakosok közel fele (46,7%) számára ismert, hogy hova fordulhatnak ilyen jellegű ismeretekért. A sport- és rekreációszervező szakosok többsége (68,6%) nem tudja, hol szerezhet utazás előtt a vakcinákról információt.

A hallgatók 76,1%-a (n = 35) szerint a családorvostól, míg 10,9%-a (n = 5) szerint az ÁNTSZ-től lehet ilyen esetben tájékoztatást kérni. Hárman (6,5%) az oek.hu internetes oldalon kerestek ilyen jellegű adatot, ugyancsak három személy (6,5%) említette információforrásként a konzuli szolgálatot, illetve négy-négy személy (8,7%-8,7%) az oltóközpontot, valamint az orvos személyét írta. Családtagtól két hallgató (4,4%) tájékozódna. A védőnő, a Külgazdasági és Külügyminisztérium, a Kormányhivatal és az immed.hu internetes oldal egy-egy esetben (esetenként 2,2%) jelent meg.

A hallgatók több mint fele (57,0%, n = 53) nem javasolná ismerősének az ajánlott védőoltás beadatását. Egy négyfokú skálán inkább egyetértettek azzal az állítással, hogy a fertőző betegségekkel szemben a legjobb védekezési eljárás a vakcinák beadatása (átlag = 2,72), ahogy azzal is, hogy ez az eljárás több előnnyel jár, mint kockázattal (átlag = 2,70). Azonban elsősorban azt hangsúlyozták, hogy a védőoltásokon kívül más hatékony módszerekkel is védekezhetünk a fertőző megbetegedésekkel szemben (átlag = 3,24). Ez az egyetértés (átlag=2,56) még igaznak mutatkozott arra az állításra is, hogy az influenza elleni vakcina ingyenes, a hatékonysága megbízható. Azzal, hogy a HPV elleni védőoltás felvétele kizárólag a lányok, a nők számára fontos, vagy, hogy a HPV nem veszélyezteti a fiúkat, férfiakat már inkább nem értettek egyet (átlag = 2,31 és 1,90).

A férfiak HPV veszélyeztetettségével kapcsolatban szignifikáns ($\chi^2(3) = 7{,}842$, $p < 0{,}05$), gyenge eltérés (Cramér-féle V = 0,290*) van a férfiak és nők között, a nők nagyobb arányban látják veszélyeztetettnek a férfiakat.

A vizsgálatba bevont hallgatók az ajánlott védőoltással beoltatják magukat, ha a családorvosuk ajánlja (átlag = 2,81) vagy félnek egy adott betegségtől (átlag = 2,55), és a felvételt befolyásolja az oltóanyag hatékonysága is (átlag = 2,97).

A védőoltással kapcsolatos döntésben közepesen erős (Cramér-féle V = 0,322*), szignifikáns ($\chi^2(3) = 9{,}629$, $p < 0{,}05$) összefüggés van a hallgató neme és aközött, hogy jelentőséget tulajdonít-e az ajánlott oltóanyag hatékonyságának. Az ajánlott vakcina hatékonyságának ismerete a nők körében (84,4%) nagyobb befolyásoló tényező az adott védőoltás felvételének eldöntésében, mint a férfiaknál (58,6%).
Úgy vélték, hogy kellő információval rendelkeznek a fertőző betegségekről, így ezen információkat is figyelembe veszik az ajánlott védőoltás beadatásának kérdésében (átlag = 2,71). Az is jellemző a vizsgálatba bevont személyekre, hogy mivel rendszeresen erősítik immunrendszerüket (átlag = 2,88) és úgy vélik a fertőző megbetegedésekkel szemben máshogy is lehet

védekezni (átlag = 2,74) nem indokolt felvenniük ajánlott védőoltásokat. A hallgatók körében nem jellemző az ajánlott oltóanyag beadatásának elutasítása az oltástól vagy az oltással járó fájdalomtól való félelem (átlag = 1,59), vagy az egészségüggyel szembeni bizalmatlanság (átlag = 2,17) miatt. Továbbá az egyénnél korábban lezajló betegség (átlag = 1,93) miatt ajánlott vakcina felvétele sem tipikus körükben.

Közepesen erős (Cramér-féle V = 0,410*), szignifikáns ($\chi^2(3) = 15,599$, $p < 0,05$) összefüggés van az ajánlott védőoltás politikai, vallási meggyőződésből történő elutasítása és a hallgató neme között. Az ajánlott védőoltásnak politikai vagy vallási meggyőződésből történő elutasítása (19,4%, n = 18) férfiak körében jellemzőbb (27,6%), nők körében kisebb számban fordult elő (15,6%).

Szignifikáns ($\chi^2(12) = 23,274$, $p < 0,05$), de gyenge összefüggés (Cramér-féle V = 0,289*) van a hallgató szakja és az arra vonatkozó szemlélete között, hogy a védőoltásokra nincs szükség, mert a betegség leküzdése erősíti az immunrendszert. A mentálhigiénés közösség- és kapcsolatépítő mesterképzési szakon tanuló hallgatók több mint fele (56,0%) úgy véli, hogy nincsen szüksége ajánlott vakcina felvételére, mert a betegség legyőzése immunrendszerét erősíti. A többi szakon tanuló hallgatónak kevesebb mint a felére (sport- és rekreációszervező 45,7%, edző 33,3%, egészségfejlesztő mentálhigiénikus 27,3%, egészségfejlesztő mentálhigiénikus pedagógus szakvizsgázó 28,6%) igaz ez a szemlélet.

Ugyancsak szignifikáns ($\chi^2(12) = 23,644$, $p < 0,05$), gyenge összefüggés (Cramér-féle V = 0,291*) van a hallgató tanulmánya és a fertőző betegségekkel kapcsolatos tájékozottság szubjektív megítélése között. Képzési szakok szerint a hallgatók több mint felére igaz, hogy kellő információt birtokolnak a fertőző megbetegedésekről, amelyek ismeretében döntenek ajánlott védőoltás felvételéről. Az egészségfejlesztő mentálhigiénikus pedagógus szakvizsgára felkészítő továbbképzésben részt vevő vizsgálatba bevont hallgatók körében ez az állítás mindenki esetében helytálló.

MEGBESZÉLÉS

A Szegedi Tudományegyetem Juhász Gyula Pedagógusképző Kar Alkalmazott Egészségtudományi és Környezeti Nevelés Intézetben tanulmányokat folytató hallgatók körében nem jellemző az ajánlott védőoltások felvétele, viszont gyermekeiknek többségében (82,1%) adattak már be javasolt oltóanyagot. A hallgatók döntését az ajánlott védőoltások beadatásával kapcsolatban befolyásolja annak költségvonzata. A hallgatók mintegy fele (57,0%) beoltatná magát HPV elleni védőoltással, ha az ingyenes lenne.

Az influenza elleni oltóanyag beadatása – hasonlóan más vizsgálati eredményekhez – a válaszadók kevesebb mint egyharmadát, főként a férfiakat jellemzi. 2018-as hazai vizsgálat eredménye szerint az orvostanhallgatók 24%-a vette fel az influenza elleni védőoltást, főként a férfiak (Fehér, Fekete, Varga, & Horváth, 2019). Ugyancsak 2018-ban végeztek vizsgálatot a Szegedi Tudományegyetemen tanuló hallgatók körében, akiknek 30,6%-a vett már fel influenza elleni vakcinát, az oltást nem felvettek 31%-a később sem fogja beadatni (Vezér et al., 2019). Akik nem kérik az influenza elleni védőoltás beadatását, elsősorban azzal indokolták döntésüket, hogy nem tartják szükségesnek az oltóanyagot, illetve az azzal szembeni bizalmatlanság is megjelent érveik között. Mindez a nem megfelelő tájékozottságot tükrözi, hiszen bizonyított, hogy az influenza elleni védőoltás más betegségek lefolyására is kedvező hatással van, az influenza elkerülésén túl (Vajó, 2021).

Kedvező, hogy a hallgatók fele (53,8%) tájékozódik az ajánlott védőoltásokról. Képzési szak szerint, elsősorban a szakvizsgát adó képzésben részt vevő (100,0%) és a posztgraduális (90,9%) képzésben részt vevő hallgatók tájékozódnak a javasolt vakcinákról, legkevésbé pedig az alapképzésben részt vevőknek fontos. Az információik forrása elsősorban a családorvosuk, vagy a gyermekük orvosa. Eredményünk megerősítette, hogy a családorvosok jelentős szerepet töltenek be az emberek ajánlott védőoltásokkal kapcsolatos döntési folyamatában (Hajnal, Busa, Papp, & Balogh, 2017). Lényeges kiemelni, hogy az internetes források használata is jelen van körükben, de a vizsgálatba bevont személyek mindössze 14,0%-a tudott megnevezni internetes oldalt /

oldalakat, ahonnan megbízható információkhoz juthat. Főként a posztgraduális képzésben résztvevők neveztek meg internetes felületeket forrásként, viszont ezt az alapképzésből vizsgálatba bevont hallgatók egyike sem tette.

A hallgatók közel 60%-a nem is javasolná ajánlott oltóanyag felvételét. Véleményük szerint más hatékony módszerei is vannak a védekezésnek a fertőző betegségekkel szemben. Ez persze nem jelenti, hogy ne ismernék el a védőoltások szerepét a fertőző megbetegedésekkel szemben, vagy hogy ne tudnák, hogy több előnye van a vakcináknak, mint kockázata. Úgy vélik, elegendő ismereteket birtokolnak ezen a téren, hogy döntést tudjanak hozni az ajánlott védőoltás felvételét illetően. Döntésükben szerepet játszik az oltóanyag hatékonysága (elsősorban a nők körében), valamint az, ha a családorvosuk ajánlja, de a betegségtől való félelmük is. A felmérésből kiderült, hogy egyeseknek vannak hibás ismereteik az oltásokkal kapcsolatban, amely kapcsán szükséges lenne helyesbítés, míg másoknál a bizonytalanságok eloszlatására lenne szükség. A hallgatók több mint egyharmada (38,7%) helytelenül látja, hogy kizárólag a lányok, a nők számára fontos a HPV elleni védőoltás beadatása. A hallgatók többsége (76,3%) tudja, vagy úgy gondolja, hogy a HPV a fiúkra, a férfiakra is veszélyes lehet, de megjelentek a felmérésben az ezt tagadó, helytelen elgondolások is. Az eredmény még így is kedvezőbbnek mutatkozik egy 2017-es hazai vizsgálat tapasztalatához képest. Ebben ugyanis a 18 év alatti gyermeket nevelő magyar szülők 76%-a helytelenül gondolta vagy nem tudta, hogy a HPV súlyos megbetegedést okozhat a fiúk, férfiak körében is. E korábbi kutatás eredménye szerint is lényeges a megfelelő ismeret, tudás birtoklása az adott fertőzésről, és a fertőzés által okozott megbetegedésről ahhoz, hogy megfelelő döntést tudjunk hozni az ajánlott védőoltások beadatását illetően (Kun, Gács, Benedek, Mészner, & Koltai, 2017).

KÖVETKEZTETÉSEK

A vizsgálat rámutatott arra, mennyire fontos, hogy azok a hallgatók, akiknek szakterülete az egészségtudományokhoz kötődik, helyes információkkal rendelkezzenek a védőoltásokkal kapcsolatban. Az is lényeges, hogy szemléletük ne elutasító legyen a kötelező vagy ajánlott védőoltások beadatása terén. Ezeknek a hallgatóknak ismerniük kell a tudományosan alátámasztott tényeket, a megbízható, hiteles forrásokat és fontos, hogy képesek legyenek kritikusan gondolkodni. Ebből az következik, hogy az előadás mellett olyan pedagógiai módszerek is nagyobb hangsúlyt kell, hogy kapjanak a felsőoktatásban, amelyekkel a hallgatók kritikus gondolkodása erősíthető. Kritikus gondolkodás kell például a disputa módszer eredményes alkalmazásához.

Szükségszerű lenne, hogy az ajánlott védőoltásokkal megelőzhető fertőző betegségek kockázati tényezőit is ismerjék. Mindez azért különösen fontos, mert ezek a leendő szakemberek emberekkel fognak dolgozni vagy dolgoznak jelenleg is, tehát hatással vannak a társadalom tagjaira, és befolyásolni tudják őket, hogy felelősségteljes döntéseket hozzanak, akár egy oltás beadatásával kapcsolatban is.
A felmérésből is látszik, hogy a hallgatók oltási attitűdjén szükséges lenne javítani, továbbá fontos lenne az oltásokkal kapcsolatos téves információk eloszlatása. Erre az újfajta kihívásra az egészségtudományokhoz kapcsolódó képzéseknek is reagálniuk kell, és a jövőben törekedni ennek beépítésére a képzési struktúrákba. Ha a hallgatók egészségkommunikációja, tájékozottsága, tudása megfelelő, képesek a környezetükben lévő emberek oltásokra vonatkozó attitűdjét kedvező irányba befolyásolni, az azokkal kapcsolatos tévhiteket eloszlatni.

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A védőoltásokkal kapcsolatos ismeretek és attitűdök orvostanhallgatók körében a COVID–19-pandémia alatt

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Bevezetés: Magyarországon az életkorhoz kötött kötelező oltások vonatkozásában közel 100%-os a lakosság átoltottsága. Az ajánlott oltások esetében viszont már kevésbé kedvező a helyzet, ráadásul a COVID–19-pandémia alatt a korábbinál nagyobb mértékben jelent meg az oltásellenesség is egyes csoportokban, melynek visszaszorítása minden egészségügyi szakembernek feladata.
Célkitűzés: A védőoltásokkal kapcsolatos ismeretek és attitűdök feltárása, valamint ezen tényezők nemek, évfolyamok és oltási hajlandóság/bizonytalanság szerinti jellemzőinek elemzése a Szegedi Tudományegyetem orvostanhallgatói körében.
Módszer: A keresztmetszeti vizsgálat a Szegedi Tudományegyetem I. és IV. évfolyamos orvostanhallgatói körében történt online kérdőív segítségével, amely a szociodemográfiai adatokon kívül vizsgálta az influenza és a COVID–19 elleni oltás beadatását, a védőoltásokkal kapcsolatos tudás önértékelését, az oltások fontosságáról, valamint az ajánlott oltásokról alkotott hallgatói véleményeket.
Eredmények: Az Egészségügyi Világszervezet stratégiai munkacsoportjának meghatározása alapján a hallgatók 88,6%-a tartozott az „oltási hajlandóság" csoportba, akik amint elérhetővé vált a COVID–19 elleni védőoltás, azonnal beadatták azt, míg az „oltási bizonytalanság" csoportba soroltak (11,4%) csak az oltás kötelezővé tételekor vagy még akkor sem kérték az oltást. A nem és évfolyam szerint illesztett modell alapján az oltási hajlandóságot mutatók nagyobb eséllyel tartották fontosnak a védőoltások alkalmazását, a tanácsadást stb., mint a bizonytalanok, míg az ismeretek önminősítésével nem volt összefüggés. Az ajánlott oltásokkal kapcsolatos állítások esélyhányadosai alapján azonosítani lehetett az oltási hajlandósághoz, illetve bizonytalansághoz társuló véleményeket.
Megbeszélés: Összességében a hallgatói ismeretek és attitűdök pozitív képet mutattak. Kiemelendő viszont, hogy az oltási bizonytalanságot mutató hallgatóknál azonosított tévhitek megegyeznek a lakosság körében is fellelhető oltásellenes eszmékkel.
Következtetés: Az egyetemi képzés során nagyobb hangsúlyt kell kapnia a hallgatói oltási hajlandóság monitorozásának, az ismeretek és a kommunikáció fejlesztésének.
Orv Hetil. 2023; 164(21): 803–810.

Kulcsszavak: COVID–19, influenza, védőoltások, oltási bizonytalanság

Knowledge and attitudes about vaccinations among medical students during the COVID–19 pandemic

Introduction: In Hungary, regarding the age-related mandatory vaccinations, the population is almost 100% vaccinated. In the case of recommended vaccinations, however, the situation is less favourable, and during the COVID–19 pandemic, anti-vaccination sentiment has also appeared in some groups to a greater extent than before. Reducing this is the task of all health professionals.
Objective: The exploration of knowledge and attitudes about vaccinations, and the analysis of the characteristics of these factors according to gender, year and vaccine willingness/hesitancy among medical students at the University of Szeged.
Method: The cross-sectional study was conducted among first and fourth year medical students of the University, using an online questionnaire, which examined, in addition to sociodemographic characteristics, the administration

of influenza and COVID–19 vaccinations, the self-assessment of knowledge about vaccinations, the importance of vaccinations, and student opinions about recommended vaccinations.
Results: Based on the definition of the WHO Strategic Advisory Group, 88.6% of the students belonged to the "vaccine willingness" group, who administered the vaccine against COVID–19 as soon as it became available, while the "vaccine hesitancy" group (11.4%) only asked for the vaccine when vaccination was made mandatory or not even then. According to the model adjusted to gender and year, those who showed willingness to vaccinate were more likely to consider the use of vaccinations, counselling, etc. important than those who were hesitant, while there was no correlation with the self-rating of knowledge. On the basis of the odds ratio of the statements related to the recommended vaccinations, it was possible to identify the opinions associated with vaccine willingness or hesitancy.
Discussion: Overall, student knowledge and attitudes showed a positive picture. On the other hand, it should be emphasized that the misconceptions identified among students showing vaccine hesitancy are the same as the anti-vaccination sentiments found among the general population.
Conclusion: During university training, more emphasis should be placed on monitoring the willingness of students to be vaccinated, and on developing knowledge and communication.

Keywords: COVID–19, influenza, vaccines, vaccine hesitancy

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Rövidítések

COVID–19 = (coronavirus disease 2019) koronavírus-betegség 2019; EH = esélyhányados; KEH = korrigált esélyhányados; MT = megbízhatósági tartomány; SAGE = (Strategic Advisory Group of Experts on Immunization) Stratégiai Tanácsadó Szakértői Munkacsoport; SARS-CoV-2 = (severe acute respiratory syndrome coronavirus 2) súlyos akut légúti tünetegyüttest okozó koronavírus-2; SZTE = Szegedi Tudományegyetem; WHO = (World Health Organization) Egészségügyi Világszervezet

Magyarország a kötelező oltásokkal való átoltottság szempontjából a világ élmezőnyébe tartozik, az életkorhoz kötött kötelező oltások esetében megközelíti a 100%-ot a lakosság átoltottsága (2021-ben országosan 99,3–99,9%-os volt a teljesítés, de egyes oltásoknál, illetve megyéknél elérte a 100%-ot) [1]. Ennek eredményeként egyes, oltással megelőzhető betegségek (például diftéria) gyakorlatilag eltűntek hazánkból, vagy csak néhány sporadikus eset formájában jelennek meg (például rubeola, mumpsz, pertussis) [2]. A nagyarányú átoltottságot elősegíti, hogy ezen oltások térítésmentesek, beadatásukra törvény kötelez, valamint az egészségügyi szakemberek – főleg a gyermekgyógyászok és a védőnők – védőoltások iránti elkötelezettsége. Ugyancsak ismeretes, hogy hazánkban igen alacsony az oltást követő nemkívánatos események száma: 2019-ben a több mint 3 millió beadott oltással kapcsolatosan mindössze 133 bejelentés történt [3].

Kevésbé jó viszont az átoltottság – mind a gyermekek, mind az idősebb lakossági csoportok körében – az ajánlott oltások vonatkozásában. Az idős, krónikus betegek esetében ezek a védőoltások is ingyenesek, mégis alacsony e páciensek átoltottsága. Így például 2020-ban a szezonális influenza elleni oltást a 65 év felettieknek csak a 30,5%-a kapta meg Magyarországon, ami jóval alacsonyabb, mint az Európai Unió Tanácsa által ajánlott 75%-os érték [4]. Ugyancsak messze elmarad a kívánatostól az egészségügyi dolgozók influenza elleni átoltottsága (a 2017/2018-as influenzaszezonban mindössze 21,9% volt) [5].

Részben az oltásoknak köszönhetően, a szezonális influenzajárványokat leszámítva, nem volt komolyabb járványügyi teendő az utóbbi években, évtizedekben. Ilyen előzmények után, mondhatni, váratlanul érte a lakosságot a COVID–19 megjelenése, amely ellen kezdetben csak az aspecifikus módszerek – távolságtartás, maszkhasználat, kézhigiéné – jelentettek védelmet. E módszerek szerepét a COVID–19 incidenciájának csökkentésében számos vizsgálat bizonyította [6, 7]. A megelőzés szempontjából azonban a legnagyobb áttörést a betegségspecifikus védőoltások megjelenése jelentette, melyek nem egészen egy évvel a SARS-CoV-2 megjelenése után már elérhetők voltak. A lakosság többsége élt a lehetőséggel, ugyanakkor az oltásellenesség is szárnyra kapott, amely világszerte akadályozta a kellő szintű átoltottság elérését azokban az országokban is, ahol elegendő oltóanyag állt rendelkezésre [8, 9].

Jelenlegi ismereteink szerint a védőoltások jelentik a leghatékonyabb primer prevenciós eszközt a fertőző betegségekkel szemben, de a járványok kontrollálása csak akkor lehetséges, ha el tudjuk érni a megfelelő szintű átoltottságot. Ehhez meg kell nyerni a lakosságot és leginkább az egészségügyi dolgozókat. Ez utóbbiak szempontjából kiemelten fontos, hogy milyen ismeretekkel és attitűdökkel rendelkeznek a jövő orvosai.

Az egyetemi tanulmányok során az orvostanhallgatók több kurzus keretében is találkoznak a fertőző betegségekkel és a védőoltásokkal (immunológia, orvosi mikrobiológia, megelőző orvostan és népegészségtan, infektológia, gyermekgyógyászat). Mindezek ellenére korábbi hazai vizsgálatok azt mutatták ki – főleg az ajánlott oltások vonatkozásában –, hogy az elméleti tudás nem minden esetben társul az oltások gyakorlatban történő ajánlásával és a személyes példamutatással [10–12].

Az egészségügyi szakemberek, de főként az orvosok elköteleződése a védőoltások iránt különösen jelentőssé vált az oltásokkal kapcsolatos fenntartások, az oltási bizonytalanság (vaccine hesitancy) terjedése miatt, mely olyannyira teret kapott, hogy az Egészségügyi Világszervezet (World Health Organization – WHO) külön munkacsoportot (WHO SAGE, Strategic Advisory Group of Experts on Immunization) hozott létre a vizsgálatára. A munkacsoport meghatározása szerint: „oltási bizonytalanságon az oltások elfogadásának halogatását vagy az oltások visszautasítását értjük, amikor ez annak ellenére történik, hogy az oltóanyag és a beadási szolgáltatások rendelkezésre állnak" [12, 13].

Kutatásunk fő célja a COVID–19-pandémia alatti hallgatói munkavégzés vizsgálata volt, melynek keretében kitértünk a védőoltásokkal kapcsolatos véleményekre, adatokra is. A jelen tanulmány célja a védőoltásokkal kapcsolatos ismeretek és attitűdök feltárása, valamint ezen tényezők nemek, évfolyamok (I. és IV. évfolyam) és oltási hajlandóság szerinti jellemzőinek elemzése volt a Szegedi Tudományegyetem (SZTE) orvostanhallgatói körében.

Módszer

A keresztmetszeti vizsgálat az SZTE I. és IV. éves orvostanhallgatói körében történt a 2021/2022-es tanév őszi félévében. Az adatgyűjtést online kérdőívvel végeztük, a kérdőív linkjét elektronikus úton (hivatalos egyetemi kurzusfórum-üzenet [CooSpace], illetve QR-kód megadása) juttattuk el a hallgatókhoz.

A kérdőív több kérdéscsoportot tartalmazott, melyek közül a nemre, az évfolyamra és a védőoltásokra vonatkozó kérdéseket elemeztük. Vizsgáltuk az influenza és a COVID–19 elleni oltás beadatását, a védőoltásokkal kapcsolatos tudás önértékelését, az oltások fontosságáról, valamint az ajánlott oltásokról alkotott véleményeket.

Az oltási hajlandóságot/bizonytalanságot a WHO SAGE definíciója alapján határoztuk meg a COVID–19-oltás beadatásához kapcsolódóan. A *„Hallgatóként részesült-e COVID–19 elleni védőoltásban?"* kérdésre adott válaszok alapján megnéztük, hogy kik voltak azok, akik már az oltás kötelezővé tétele előtt kérték az oltást (oltási hajlandóság), illetve azok, akik csak a kötelezővé tétel után vagy még akkor sem oltatták be magukat (oltási bizonytalanság). A kérdőívet kitöltő hallgatók (n = 246) általános és oltási hajlandóság szerinti jellemzőit az *1. táblázat* mutatja be.

1. táblázat A minta általános és oltási hajlandóságra vonatkozó jellemzői (n = 246)

Jellemzők		n	%
Nem			
Nő		131	53,3
Férfi		115	46,7
Évfolyam			
I. évfolyam		153	62,2
IV. évfolyam		93	37,8
COVID–19 elleni védőoltás beadatása			
Oltási hajlandóság	Igen, amint elérhető volt az oltóanyag	218	88,6
Oltási bizonytalanság	Igen, amikor kötelező lett a hallgatóknak	21	8,5
	Nem	7	2,9
Szezonális influenza elleni védőoltás beadatása			
Igen, rendszeresen		35	14,2
Igen, alkalmanként		68	27,7
Soha		143	58,1

COVID–19 = koronavírus-betegség 2019

2. táblázat A védőoltások fontosságáról alkotott hallgatói vélemények oltási hajlandóság szerint – a „fontos" válaszok esélyhányadosa – többváltozós logisztikus regressziós elemzés (n = 246)

Állítások	Összesen	Oltási hajlandóság
	n (%)	KEH (95% MT)
A védőoltások alkalmazása általában.	235 (95,5)	12,70 (3,28; 49,17)***
Védőoltásokkal kapcsolatos tanácsadás.	231 (93,9)	5,75 (1,80; 18,40)**
A kötelező védőoltási naptár betartatása.	216 (87,8)	1,74 (0,63; 4,82)
Az önkéntesen igénybe vehető védőoltások beadatása.	194 (78,9)	6,04 (2,59; 14,08)***
Az egyes munkakörökhöz kötött kötelező védőoltások beadatása.	215 (87,4)	11,66 (4,61; 29,50)***
Az egyes munkakörökhöz tartozó ajánlott védőoltások beadatása.	207 (84,1)	7,82 (3,26; 18,72)***

Referenciakategória (EH [esélyhányados] = 1,00): oltási bizonytalanság.

KEH: korrigált esélyhányados (nemre és évfolyamra); MT: megbízhatósági tartomány.

*p<0,05; **p<0,01;*** p<0,001

A védőoltások fontosságára vonatkozó 6 állítást *(2. táblázat)* 1-től 5-ig terjedő skálán értékelték a hallgatók (1 = egyáltalán nem fontos; 5 = nagyon fontos). A védőoltásokkal kapcsolatos tudás önértékelése 5 állítás *(3. táblázat)* alapján történt, szintén 1-től 5-ig terjedő skálán (1 = nem értek egyet; 5 = teljes mértékben egyetértek). Az elemzések során összevontuk az 1–3. (a továbbiakban „nem fontos", illetve „nem értek egyet") és

3. táblázat A védőoltásokkal kapcsolatos tudás önértékelése nem, évfolyam és oltási hajlandóság szerint – az „egyetértek” válaszok esélyhányadosa – többváltozós logisztikus regressziós elemzés (n = 246)

Állítások	Összesen	Oltási hajlandóság
	n (%)	KEH (95% MT)
Teljes mértékben tájékozott vagyok a védőoltásokkal kapcsolatban.	150 (61,0)	1,92 (0,85; 4,37)
Nincsenek hiányosságaim a védőoltási teendőkkel kapcsolatos tudásom szempontjából.	112 (45,5)	1,11 (0,49; 2,52)
Magabiztosan tudok tanácsot adni a védőoltásokkal kapcsolatban a hozzám fordulónak.	104 (42,3)	2,26 (0,89; 5,72)
Tudom, hogy milyen forrásból tájékozódhatok hitelesen a védőoltásokkal kapcsolatban.	150 (61,0)	1,86 (0,82; 4,19)
Egyetemi tanulmányaim során még nem tanultam részletesen róluk, ezért kevés ismerettel rendelkezem.	104 (42,3)	1,49 (0,63; 3,47)

Referenciakategória (EH [esélyhányados] = 1,00): oltási bizonytalanság.

KEH: korrigált esélyhányados (nemre és évfolyamra); MT: megbízhatósági tartomány.

a 4–5. (a továbbiakban „fontos”, illetve „egyetértek”) válaszokat.

Tekintettel arra, hogy Magyarországon számos védőoltás beadatása kötelező, az oltási attitűdöt az ajánlott oltásokra vonatkozóan vizsgáltuk az SZTE Juhász Gyula Pedagógusképző Karának hallgatói körében végzett pilotvizsgálatban használt kérdésekkel [14]. A hallgatók 1-től 4-ig terjedő skálán értékeltek 18 állítást *(4. táblázat)* arra vonatkozóan, hogy mennyire jellemző rájuk az adott állítás (1 = egyáltalán nem jellemző; 4 = teljes mértékben jellemző). Az elemzések során összevontuk az 1–2. (a továbbiakban „nem jellemző”) és a 3–4. (a továbbiakban „jellemző”) válaszokat.

Az adatok elemzése IBM SPSS 28.0 programmal (IBM Corporation, Armonk, NY, USA) történt. Az adatokat leíró és elemző statisztikai módszerekkel értékeltük nem, évfolyam és oltási hajlandóság szerint. A csoportok összehasonlítása százalékos megoszlások és khi-négyzetpróba alapján történt. A többváltozós logisztikus regressziós elemzések során a függő változók a fontosságra, tudásra, attitűdre vonatkozó értékelések, a magyarázó (független) változók pedig a nem és évfolyam szerint illesztett oltási hajlandóság *vs.* bizonytalanság voltak. A modell illeszkedésének jóságát a Hosmer–Lemeshow-teszt segítségével vizsgáltuk. Az eredményeket korrigált esélyhányados (KEH) és 95%-os megbízhatósági tartomány (MT) formájában mutatjuk be; a szignifikancia szintje $p<0,05$ volt.

A kutatást az SZTE Regionális Humán Orvosbiológiai Tudományos és Kutatásetikai Bizottsága engedélyezte (az engedély száma: 5018). A kutatásban való részvétel önkéntes és anonim volt.

Eredmények

A kérdőívet kitöltőkre a női dominancia és az I. évfolyam magasabb részvételi aránya volt jellemző *(1. táblázat)*. Amint elérhető volt a COVID–19 elleni oltóanyag, a hallgatók többsége (218 fő, 88,6%) beadatta azt, a továbbiakban esetükben *oltási hajlandóságról* beszélünk, szemben azokkal, akik csak a kötelezőség után vagy egyáltalán nem adatták be az oltást (28 fő, 11,4%), ezt tekintettük *oltási bizonytalanságnak*, vagyis az utóbbi csoport mind a bizonytalanokat, mind az elutasítókat magában foglalja, de az alacsony elemszám miatt további alcsoportokat nem képeztünk.

Az oltási hajlandóságot mutatók 52,3%-a, a bizonytalanok 60,7%-a nő volt ($p>0,05$). Évfolyamok szerint az oltási hajlandóságot mutatók 59,2%-a, míg a bizonytalanok 85,7%-a volt I. éves ($p<0,01$). Összességében az „oltási bizonytalanság” csoportot a nők (28 főből 17 fő) és az I. évesek (28 főből 24 fő) dominanciája jellemezte.

A szezonális influenza elleni védőoltást a hallgatóknak csak a 14,2%-a adatta be rendszeresen, többségük (58,1%) pedig még soha nem volt beoltva *(1. táblázat)*. A rendszeresen oltottak 5,7%-a, míg a soha nem oltottak 16,1%-a tartozott az „oltási bizonytalanság” csoportba ($p<0,05$), nemenként és évfolyamonként nem volt szignifikáns különbség.

A védőoltások egyes jellemzőinek fontosságára vonatkozó vélemények szerint a hallgatók több mint 90%-a általában fontosnak tartotta a védőoltások alkalmazását és az azokkal kapcsolatos tanácsadást. Kevésbé (80–90% közötti) volt egyértelműen fontos a védőoltási naptár betartatása és a munkakörhöz kötött kötelező, illetve ajánlott oltások beadatása, a legkevésbé (80% alatt) fontosnak az ajánlott, önkéntes oltásokat tartották *(2. táblázat)*.

Az oltások fontosságáról alkotott vélemények nemek szerint nem mutattak különbséget. Évfolyamok szerint a IV. évfolyamosok szignifikánsan pozitívabb véleményt formáltak, mint az I. évesek a következő három állításnál: *kötelező védőoltási naptár betartatása* (94,6% *vs.* 83,7%, $p<0,05$); *munkakörhöz kötött kötelező oltások beadatása* (96,8% *vs.* 81,7%, $p<0,001$); *munkakörhöz kötött ajánlott oltások beadatása* (92,5% *vs.* 79,1%, $p<0,01$). Az oltási hajlandóság, illetve bizonytalanság szerinti összehasonlítás – a kötelező védőoltási naptár betartatásának kivételével – szignifikánsan kedvezőbb volt az oltáspártiak körében.

A többváltozós, nem és évfolyam szerint illesztett logisztikus regressziós elemzés az oltási hajlandóság, illetve bizonytalanság és az egyes állítások fontossága közötti összefüggést vizsgálta *(2. táblázat)*. A korrigált esélyhányadosok szerint – *a kötelező védőoltási naptár betartatása* állításnak a kivételével – oltási hajlandóság esetén szignifikánsan nagyobb volt az esélye az adott állítás fontosnak ítélésére.

A *3. táblázat* a hallgatók védőoltásokkal kapcsolatos tudásának önértékelését mutatja be. Összességében a

4. táblázat | A védőoltásokkal kapcsolatos állítások értékelése oltási hajlandóság szerint – a „jellemző” válaszok esélyhányadosa – többváltozós logisztikus regressziós elemzés (N = 246)

Állítások	Összesen n (%)	Oltási hajlandóság KEH (95% MT)
1. Nincs szükségem ajánlott védőoltásokra, az immunrendszeremet rendszeresen erősítem.	61 (24,8)	0,13 (0,05; 0,31)***
2. Ha a háziorvosom javasol egy védőoltást, akkor beadatom az adott védőoltást.	188 (76,4)	4,13 (1,79; 9,53)***
3. Az ajánlott oltóanyag hatékonysága fontos információ a számomra, befolyásolja döntésemet, hogy beadatom-e az ajánlott védőoltást.	185 (75,2)	1,36 (0,57; 3,25)
4. Ha félek az adott betegségtől, akkor beadatom az ajánlott védőoltást.	203 (82,5)	5,77 (2,45; 13,60)***
5. Nem csak védőoltásokkal védekezhetünk a fertőző betegségekkel szemben, ezért nem adatok be ajánlott védőoltást.	43 (17,5)	0,18 (0,08; 0,43)***
6. Nem kérek ajánlott védőoltást, mert nem rendelkezem megfelelő információval az adott betegségről, amit elkerülhetnék az oltóanyag felvételével.	35 (14,2)	0,42 (0,16; 1,10)
7. Nincs szükségem védőoltásokra, nem félek a fertőző betegségektől.	24 (9,8)	0,40 (0,14; 1,16)
8. Egészséges életmód mellett nincs szükségem ajánlott védőoltásokra.	29 (11,8)	0,15 (0,05; 0,41)***
9. Ha a családomban vagy ismeretségi körömben előfordult már megbetegedés, akkor beadatom az ajánlott védőoltást.	154 (62,6)	3,73 (1,61; 8,63)**
10. Az ajánlott védőoltás ára befolyásolja nálam, hogy igénylem-e az adott védőoltást.	65 (26,4)	1,49 (0,57; 3,92)
11. Nálam korábban lezajlott megbetegedés miatt adatom be az ajánlott védőoltást.	123 (50,0)	2,75 (1,14; 6,61)*
12. Nem adatok be ajánlott védőoltást, bizalmatlan vagyok egyes egészségügyi információkkal szemben.	28 (11,4)	0,29 (0,11; 0,78)*
13. Nincs szükségem ajánlott védőoltásokra, a betegség leküzdése erősíti az immunrendszeremet.	37 (15,0)	0,28 (0,12; 0,70)**
14. Nem adatom be az ajánlott védőoltásokat, mert félek az oltástól, az oltással járó fájdalomtól.	24 (9,8)	0,22 (0,08; 0,59)**
15. Nem adatom be az ajánlott védőoltásokat, mert tartok a mellékhatásoktól.	31 (12,6)	0,17 (0,07; 0,42)***
16. Az ajánlott védőoltás árát időnként figyelmen kívül hagyom, a cél a fertőző betegség elkerülése.	150 (61,0)	1,76 (0,78; 3,96)
17. Kellő információm, tudásom van a fertőző betegségekről, így az ajánlott védőoltásról ennek ismeretében döntök.	166 (67,5)	2,14 (0,94; 4,86)
18. Nem adatok be ajánlott védőoltást politikai, vallási meggyőződésből.	50 (20,3)	0,96 (0,36; 2,59)

Referenciakategória (EH [esélyhányados] = 1,00): oltási bizonytalanság.

KEH: korrigált esélyhányados (nemre és évfolyamra); MT: megbízhatósági tartomány.

*p<0,05; **p<0,01;*** p<0,001

hallgatók 61%-a érezte magát teljes mértékben tájékozottnak a védőoltásokról, illetve tudta, hogy honnan juthat hiteles információkhoz. A védőoltásokkal kapcsolatos teendőket illetően kevésbé voltak biztosak tudásukban a hallgatók: 45,5%-uk vélte úgy, hogy nincsenek hiányosságai, 42,3%-uk érezte úgy, hogy magabiztosan tud tanácsot adni a védőoltásokkal kapcsolatban. A hallgatók 42,3%-a még nem tanult részletesen a védőoltásokról, ezért ismeretük azokról hiányos volt.

A tudás önértékelése szignifikánsan jobbnak bizonyult a férfiak körében, akik nagyobb arányban érezték tájékozottabbnak magukat (68,7% *vs.* 54,2%, p<0,05); biztosabb volt a tudásuk a teendőkkel (54,8% *vs.* 37,4%, p<0,01) és a tanácsadással (54,8% *vs.* 31,3%, p<0,001) kapcsolatban, valamint a hiteles forrásokat is jobban ismerték (68,7% *vs.* 54,2%, p<0,05).

Az I. évfolyamos hallgatók 59,5%-a, míg a IV. évfolyamosok 14,0%-a érezte úgy, hogy kevés az ismerete, mert még nem tanult a témáról az egyetemen (p<0,001). Kereszttábla-elemzések szerint a tájékozottság (63,3% *vs.* 42,9%, p<0,05) és a tanácsadás (44,5% *vs.* 25,0%, p<0,05) esetén jobbnak ítélték tudásukat az oltási hajlandósággal jellemezhető hallgatók. A nemre és évfolyamra korrigált logisztikus regressziós elemzés során ezek a különbségek már nem álltak fenn, az oltási hajlandóság és a tudás önértékelése között nem volt szignifikáns összefüggés *(3. táblázat)*.

Az ajánlott védőoltásokkal kapcsolatos attitűdre vonatkozó 18 állítás *(4. táblázat)* közül nemek szerint a férfiakra nagyobb mértékben volt jellemző az *„egészséges életmód mellett nincs szükségem ajánlott védőoltásokra”* (18,3% *vs.* 6,1%, p<0,01) és a *„nem adatok be ajánlott védőoltást politikai, vallási meggyőződésből”* (27,0% *vs.* 14,5%, p<0,05) megállapítás.

Évfolyamok szerint több állításnál volt szignifikáns különbség a véleményekben. Nagyobb arányban jelölték jellemzőnek a IV. éves hallgatók a *„ha félek az adott betegségtől, akkor beadatom az ajánlott védőoltást”* (89,2% *vs.* 78,4%, p<0,05) és a *„kellő információm, tudásom van a fertőző betegségekről, így az ajánlott védőoltásról ennek ismeretében döntök”* (81,7% *vs.* 58,8%, p<0,001) megálla-

pításokat, míg a többi állítás (*4. táblázat,* a 6–8., 12–15. állítások) az I. évfolyamra volt inkább jellemző.

Az oltási hajlandóság szerinti kereszttábla-elemzések során négy állítás (*4. táblázat,* a 3., 10., 16. és 18. állítások) kivételével szignifikáns különbség mutatkozott az állítások jellemzőségében. Ezek a különbségek a nem és évfolyam szerint korrigált többváltozós elemzések során is többnyire megmaradtak (kivéve a 6., 7. és 17. állítást). Az esélyhányadosok alapján az oltási hajlandósággal jellemezhető hallgatók az alábbi állításokat preferálták:

- *Ha a háziorvosom javasol egy védőoltást, akkor beadatom az adott védőoltást.*
- *Ha félek az adott betegségtől, akkor beadatom az ajánlott védőoltást.*
- *Ha a családomban vagy ismeretségi körömben előfordult már megbetegedés, akkor beadatom az ajánlott védőoltást.*
- *Nálam korábban lezajlott megbetegedés miatt adatom be az ajánlott védőoltást.*

Az oltási bizonytalansággal jellemezhető hallgatók által preferált állítások:

- *Nincs szükségem ajánlott védőoltásokra, az immunrendszeremet rendszeresen erősítem.*
- *Nem csak védőoltásokkal védekezhetünk a fertőző betegségekkel szemben, ezért nem adatok be ajánlott védőoltást.*
- *Egészséges életmód mellett nincs szükségem ajánlott védőoltásokra.*
- *Nem adatok be ajánlott védőoltást, bizalmatlan vagyok egyes egészségügyi információkkal szemben.*
- *Nincs szükségem ajánlott védőoltásokra, a betegség leküzdése erősíti az immunrendszeremet.*
- *Nem adatom be az ajánlott védőoltásokat, mert félek az oltástól, az oltással járó fájdalomtól.*
- *Nem adatom be az ajánlott védőoltásokat, mert tartok a mellékhatásoktól.*

Megbeszélés

Vizsgálatunkban az orvostanhallgatók védőoltásokkal kapcsolatos tudását, attitűdjét mértük fel az oltási hajlandósággal, illetve bizonytalansággal összefüggésben. A WHO SAGE meghatározása alapján a hallgatók 11,4%-a minősült bizonytalannak a védőoltásokkal („oltási bizonytalanság") kapcsolatban, míg a többség az „oltási hajlandóság" csoportba tartozott, ők azok, akik már a COVID–19-oltás elérhetősége idején kérték a védőoltást. A COVID–19 elleni magas hallgatói átoltottsággal ellentétben a szezonális influenza elleni oltást csak minden 7. hallgató adatta be rendszeresen.

Eredményeink szerint a hallgatók többsége fontosnak tartotta a védőoltások alkalmazását, az oltásokkal kapcsolatos tanácsadást és a különböző típusú (kötelező, ajánlott) oltások beadását/beadatását. Kiemelendő, hogy a nem és az évfolyam kevéssé, míg az oltási hajlandóság, illetve bizonytalanság szignifikánsan befolyásolta az ezek fontosságáról alkotott véleményeket. Az oltásokkal kapcsolatos tudás megítélése főleg nemek szerint volt eltérő, a férfiak minden területen jobbnak értékelték a tudásukat, mint a nők. Az évfolyamok között elsősorban az egyetemi tanulmányok során megszerzett ismeretekben volt különbség, az oltási hajlandóság, illetve bizonytalanság viszont nem mutatott szignifikáns összefüggést az ismeretek önminősítésével.

Tekintettel arra, hogy Magyarországon a védőoltások egy része kötelező, az oltásokkal kapcsolatos attitűdöket az ajánlott oltásokra vonatkozó állítások alapján vizsgáltuk. Ezen állítások többváltozós elemzése alapján az oltási hajlandóságot és az oltási bizonytalanságot jellemző állításokat azonosítottunk. Az oltási hajlandóság négy állítással mutatott szignifikáns kapcsolatot, ezek a háziorvosi javaslatot vagy korábbi ismeretet, betegségtől való félelmet tartalmazták. Az oltási bizonytalanság hét állítással mutatott szoros összefüggést, melyek többnyire arra utaltak, hogy más módszerekkel (egészséges életmód, immunerősítés stb.) is védekezhetünk a fertőző betegségekkel szemben, valamint megjelent az oltástól, annak mellékhatásaitól való félelem és az egészségüggyel szembeni bizalmatlanság is.

Korábbi hazai vizsgálatok főleg az influenza elleni oltásokra, a lakosság és speciális csoportok (például egészségügyi dolgozók, hallgatók) átoltottságára, oltási hajlandóságára irányultak. Az SZTE-n történt korábbi vizsgálat szerint az influenzaoltást illetően az egészségügyi dolgozók 59,0%-a, az orvostanhallgatók 39,2%-a vallotta magát életében valaha oltottnak. Az utolsó vizsgált influenzaszezonban ezek az értékek 36,3%, illetve 16,7% voltak [11], mely utóbbi hasonló a mi vizsgálatunkban rendszeresen oltott hallgatók arányához.

Mátó ugyancsak az SZTE-n, de nem kifejezetten egészségügyi, hanem egészségfejlesztésben érintett pedagógushallgatók körében vizsgálta a vakcinációhoz való hozzáállást az ajánlott védőoltások vonatkozásában [14]. Az influenza elleni vakcinát a pedagógushallgatók kevesebb mint egyharmada adatta be valaha, a vizsgálat időszakában és a megelőző 5 évben 8,6%-uk kapta meg a védőoltást. A hallgatók fele tájékozódott az ajánlott védőoltásokról, de többségük nem javasolná az ajánlott oltóanyag felvételét, mivel más módszerek is vannak a védekezésre [14]. Saját vizsgálatunk szerint mind az influenzaátoltottság, mind az ajánlott védőoltásokkal kapcsolatos vélemények kedvezőbb képet mutattak az orvostanhallgatók körében.

IV. és V. éves orvostanhallgatók vakcinológiai tájékozottságát és influenza elleni átoltottságát a Semmelweis Egyetemen is vizsgálták a népegészségtan-oktatáshoz kapcsolódóan [10]. Az influenza elleni – nem kötelező, de ajánlott – oltás esetében az oktatás előtt (IV. évfolyam) csak 6,5% volt az átoltottság, amely az oktatás után (V. évfolyam) 24%-ra nőtt [10]. Elsősorban a jövendő orvosokra gondolva megjegyzendő, hogy egyik érték sem közelíti meg az Európai Unió Tanácsa által az egészségügyi dolgozók esetében ajánlott 75%-os arányt [5].

Eörsi és mtsai a lakosság és háziorvosok körében vizsgálták az influenza elleni védőoltást. Az oltás lehetősége jól ismert a lakosság körében, de az átoltottság még a rizikócsoportokban is nagyon alacsony volt (a 2020. évi influenzaszezonban 17%), jóval alacsonyabb, mint amit maguk a háziorvosok becsültek [15]. Érdekes eredmény az is, hogy míg a háziorvosok 95%-a úgy nyilatkozott, hogy rendszeresen ajánlja az influenza elleni oltást a betegeinek, addig a betegeknek csak a 27%-a vélte úgy, hogy kapott ilyen ajánlást a háziorvosától [15].

A lakosság oltási hajlandóságát is számos kutatásban vizsgálták. *Schmid és mtsai* az influenzaoltással kapcsolatos szisztematikus áttekintés során azt találták, hogy kedvezőtlenebb az oltási hajlandóság a férfiaknál, a fiatalabbaknál, az alacsony társadalmi-gazdasági helyzetűeknél és azoknál, akik nem tartoznak az influenza kockázati csoportjába, ezek mellett az oltáshoz, betegséghez való hozzáállás is meghatározó szerepet tölt be [16].

A COVID–19-oltás kapcsán is több vizsgálat történt [17–21]. Az Ipsos ismételt felmérések során több országban, így Magyarországon is vizsgálta a COVID–19-oltás iránti igényeket, az elutasításának fő okát [17, 18]. A 2020 nyarán 27 országban végzett felmérés során a magyarok 44%-a utasította el az oltást (globálisan ez az érték 26% volt): az oltást ellenző magyarok 59%-a félt a mellékhatásoktól, 35% nem tartotta eredményesnek, 22% nem érezte magát COVID–19-kockázati csoportba tartozónak, 16% általánosságban nem hisz az oltásokban [17, 19]. A 2022 februárjában 30 országban végzett felmérés kitért az oltás kötelezővé tételére is, a globálisan a megkérdezettek 63%-a, míg a magyarok 38%-a támogatta a kötelezővé tételt [18]. *Brys és mtsai* 2021 decemberében végeztek kérdőíves felmérést a 18–65 éves magyar lakosság körében, melynek során azt találták, hogy az oltás visszautasításának nagyobb az esélye a kedvezőtlen társadalmi-gazdasági helyzetűek, a nők, a fiatalabbak, a kistelepülésen élők, valamint az egészségi állapotukat jobbnak ítélők körében [20]. *Mészáros és mtsai* az oltásokkal kapcsolatos információs csatornákat is vizsgálták különböző oltási attitűddel rendelkező lakossági csoportokban. Eredményeik szerint a pandémia kezdetén elsősorban az internetes hírportálok és a televízió jelentették a legfőbb forrást, ami fokozatosan megváltozott, és egyre nagyobb szerepük lett az orvosoknak, valamint az egészségügyi személyzetnek a tájékoztatásban [21].

Ezek az eredmények rámutatnak arra, hogy hazánkban is jelentős az oltásokkal, jelen esetben a COVID–19-oltással kapcsolatos bizalmatlanság, melynek csökkentésében meghatározó szerepük van a hiteles információkat nyújtó egészségügyi dolgozóknak. Mindezek alapját pedig az oktatás képezi, melyet már az egyetemi évek alatt meg kell teremteni.

Különösen fontossá vált ez a kérdés a COVID–19-pandémia során, hiszen a lakosság oltási hajlandósága nagymértékben befolyásolja, hogy mennyire lesz sikeres az oltási kampány és ezzel a járvány megfékezése. Az oltási hajlandóság vizsgálata előtérbe került mind az egészségügyi dolgozók, mind a lakosság oldaláról. Számos közlemény jelent meg, többek között az orvos-, ápolóhallgatók körében végzett felmérésekről. Az oltási bizonytalanság igen változatosan alakult ezen vizsgálatok alapján.

Gautier és mtsai azt találták, hogy a francia hallgatók 44,5%-a oltásellenes (oltási bizonytalan) volt, de a legkevésbé bizonytalanok (16,0%) az orvostanhallgatók voltak. Az oltási bizonytalanság összefüggést mutatott többek között a nemmel (a nők körében nagyobb volt a bizonytalanság), a kurzusokkal és az influenza elleni oltással [22]. Egy indiai, szintén orvostanhallgatók között végzett vizsgálatban 10,6% volt azok aránya, akik elutasították (4,0%), illetve bizonytalanok (6,6%) voltak az oltást illetően [23].

Saját eredményeink szerint a magyar orvostanhallgatók oltási bizonytalansága kedvezőbb, mint a francia orvostanhallgatóké, inkább az indiai értékhez közelít, ugyanakkor a franciákhoz hasonlóan nagyobb mértékű a nők és az influenza ellen nem oltottak esetében.

Roberts és mtsai német orvostanhallgatók védőoltással kapcsolatos attitűdjét, tudásának önértékelését, valamint a vakcinológiaoktatás minőségét vizsgálták, és a mi vizsgálatunkhoz hasonlóan azt találták, hogy a férfi hallgatók jobbnak ítélik a védőoltásokkal kapcsolatos tudásukat, de szerepe van a gyakorlatnak is [24].

A hazai és a nemzetközi eredmények egyaránt azt mutatják, hogy az orvostanhallgatók körében megfigyelhető oltásokkal kapcsolatos bizonytalanságot több tényező befolyásolja, így a kurzusok, maga az egyetemi oktatás is. Saját vizsgálatunkban is azt mutattuk ki, hogy a még kevesebb elméleti (és gyakorlati) ismerettel rendelkező I. évesek között többen voltak a bizonytalanok, mint a IV. évesek között, akiknél a biztosabb tudás, az egyetem alatt megszerzett ismeretek pozitív irányba befolyásoló hatása érvényesült. Ugyanakkor azt is láttuk, hogy a hallgatók körében is fellelhetők azok a tévhitek (például „nincs szükségem ajánlott védőoltásokra, az immunrendszeremet rendszeresen erősítem”, „félek a mellékhatásoktól”), amelyek a lakosság körében is társulnak az oltásellenességgel.

Következtetés

Jelenleg hazánkban a kötelező oltások terén kiváló teljesítményt nyújtunk, de ez messze nem teljesül még az ingyenesen igénybe vehető önkéntes oltások esetében sem. Ez utóbbi javítására feltétlenül szükség van, amiben az egészségügyi szakembereknek, különösen az orvosoknak meghatározó szerepet kell betölteniük. Ehhez mind a graduális, mind a posztgraduális képzés során szükség van a védőoltásokkal kapcsolatos tudás növelésére, az ismeretek naprakészen tartására, valamint a beteggel való kommunikáció fejlesztésére.

Anyagi támogatás: M. V. részvételét a tanulmány elkészítésében a Magyar Tudományos Akadémia Közoktatás-Fejlesztési Kutatási Programja támogatta.

Szerzői munkamegosztás: P. E., M. R., Zs. V., M. V.: A vizsgálat megtervezése, a kérdőív összeállítása, statisztikai elemzés, a kézirat szövegezése, javítása. M. Zs., M.-N. Á., M.-K. M., S. A.: Szakirodalom-kutatás, adatgyűjtés, az adatbázis ellenőrzése, tisztítása, az adatok elemzése, a kézirat szövegezése. A cikk végleges változatát minden szerző elolvasta és jóváhagyta.

Érdekeltségek: A szerzőknek nincsenek érdekeltségeik.

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Co-author certification

I, myself as a corresponding author of the following publication(s) declare that the authors have no conflict of interest, and Veronika Máté Ph.D. candidate had significant contribution to the jointly published research(es). The results discussed in her thesis were not used and not intended to be used in any other qualification process for obtaining a PhD degree.

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