Web-based occupational stress prevention system

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Abstract

This paper discusses the design and use of a web-based occupational stress prevention system in Estonia. There was a pressing need for such a system since 38% of the Estonian labour force manifests occupational stress. The cost of occupational stress is high - it includes human suffering as well as medical and socio-economic problems. It also causes considerable disturbances in terms of productivity and competitiveness. The web-based occupational stress prevention system was developed for decreasing occupational stress through offering individual assistance, advice and guidance using e-psychodiagnostics and e-learning.

Introduction

In the European Union (EU) work-related stress has been consistently identified over the past decade as one of the major workplace concerns (European Commission, 1999): a challenge not only to the health of working people but also to the healthiness of their organizations. Work-related stress is conditioned by, and contributes to, major environmental, economic and health problems. It affects at least 40 million workers in the EU Member States and costs at least EUR 20 billion annually (European Commission, 1999). The human and financial cost of occupational stress to business and industry is increasing. In the UK, over 5% of the gross national product (GNP) is spent on solving stress-related medical and socio-economic problems. Occupational stress contributes to the cost of human suffering, disease and death. It also causes considerable disturbances in terms of productivity and competitiveness. Much of this is likely to be preventable. In, addition a growing body of empirical evidence shows that in Eastern European countries occupational stress levels are even higher than in Western Europe and the US (Sparks et al., 1999; Spector et al., 2001; Spector et al., 2002; Teichmann, 2004; Teichmann et al., 2005; Teichmann et al., 2006).

The starting-point of any prevention work is to provide a clear, coherent and precise definition of occupational stress. However, prominent researchers have found that this is not straightforward (Cooper, 2004; Hart & Cooper, 2001). The on-going debate about the meaning and definition of occupational stress shows that the academic community has still not adopted a common position. The stressor and strain approach is the core of the majority of recent research into

occupational stress. This approach is based on a relatively simplistic theory that views stress as occurring when work characteristics contribute to poor psychological or physical health (Beehr, 1999). According to this approach, stressors refer to work-related characteristics, events or situations that give rise to stress, and strain refers to the employees' psychological or physiological responses to stress. The main interest, however, focuses on the presumed causal relationship between stressors and strain. The stressor and strain approach is generally the accepted definition of occupational stress in the EU. Work-related stress is defined as the emotional, cognitive, behavioral and physiological reaction to aversive and noxious aspects of work, work environments and work organizations. It is a state characterised by high levels of arousal and distress and often by feelings of not coping (European Commission, 1999).

Empirical evidence shows that in Eastern European countries occupational stress level is even higher than in Western Europe and the US. For example, 38% of the Estonian labour force manifests occupational stress (Praxis, 2002). The human and financial cost of occupational stress to business and industry is increasing contributing to human suffering, disease and accidents. It also causes considerable disturbances in terms of productivity and competitiveness; much of all this is highly like to be preventable.

The Occupational Stress Prevention System

The occupational stress prevention system was launched in the autumn of 2006 (Teichmann & Ilvest, 2007) and is available in the web environment (*http://www.pekonsult.ee/stress.php*) free of charge for all users. A system was developed for decreasing occupational stress by offering psychodiagnostics, knowledge, advice and guidance to enabling coping. The system includes: a) the Occupational Stress Indicator (OSI-2); b) individual feedback for the user; and c) two digital teaching tools on "Occupational Stress" and "Coping with Stress".

Occupational Stress Indicator (OSI-2)

The OSI-2 comprises of 90 items. Measures of job satisfaction are divided into two subscales; satisfaction with the job itself and satisfaction with the organization (12 items). Items have six response choices ranging from "very much dissatisfaction" to "very much satisfaction". Psychological well-being is divided into three subscales: contentment, resilience and peace of mind (12 items) All items have six response choices; with some variation. For example, "If colleagues and friends behave in an aloof way towards you, do you tend to worry about what you may have done to offend then as opposed to just dismissing it?" Choices ranged from "definitely worry" to "definitely do not worry". For all three scales, a high score represented high level of well-being. Physical well-being is divided into two subscales; calmness and energy (six items) asking about somatic symptoms such as shortness of breath and muscle trembling (with six responses range from "never" to "very frequently").

In addition, there is a Type-A behaviour indicator (six items); and a locus of control scale (four items).

The Work Locus of Scale (Spector, 1988) assesses employees' beliefs about their control at work in general. Half the items indicate external locus of control, whereas the other half indicate internal locus of control. Work locus of control reflects the individual's tendency to believe that they control events in their working life (internality) or that such control resides elsewhere, e.g., with powerful others (externality). The Work Locus of Control Scale (WLCS) has 16-items assessing employee beliefs about their control at work in general. For example, external locus "Getting the job you want is mostly a matter of luck" and internal locus "Promotions are given to employees who perform well on the job". All items have six response choices range from "strongly disagree" to "strongly agree". High scores represent externality and low scores internality.

Exploration of sources of pressure in the job examines eight job stressors: workload (PW, six items), relationships (PR, eight items), home/work balance (PH, six items), managerial role (PM, four items), personal responsibility (PP, four items), hassles (PD, four items), recognition (PC, four items), and organizational climate (PO, four items). All occupational stressors' scales have six response choices ranging from "very definitely is not a source" to "very definitely is a source". Coping with occupational stress is divided into two subscales: control over stress (six

items) and social support (four items) with six response choices from “strongly disagree” to “strongly agree”.

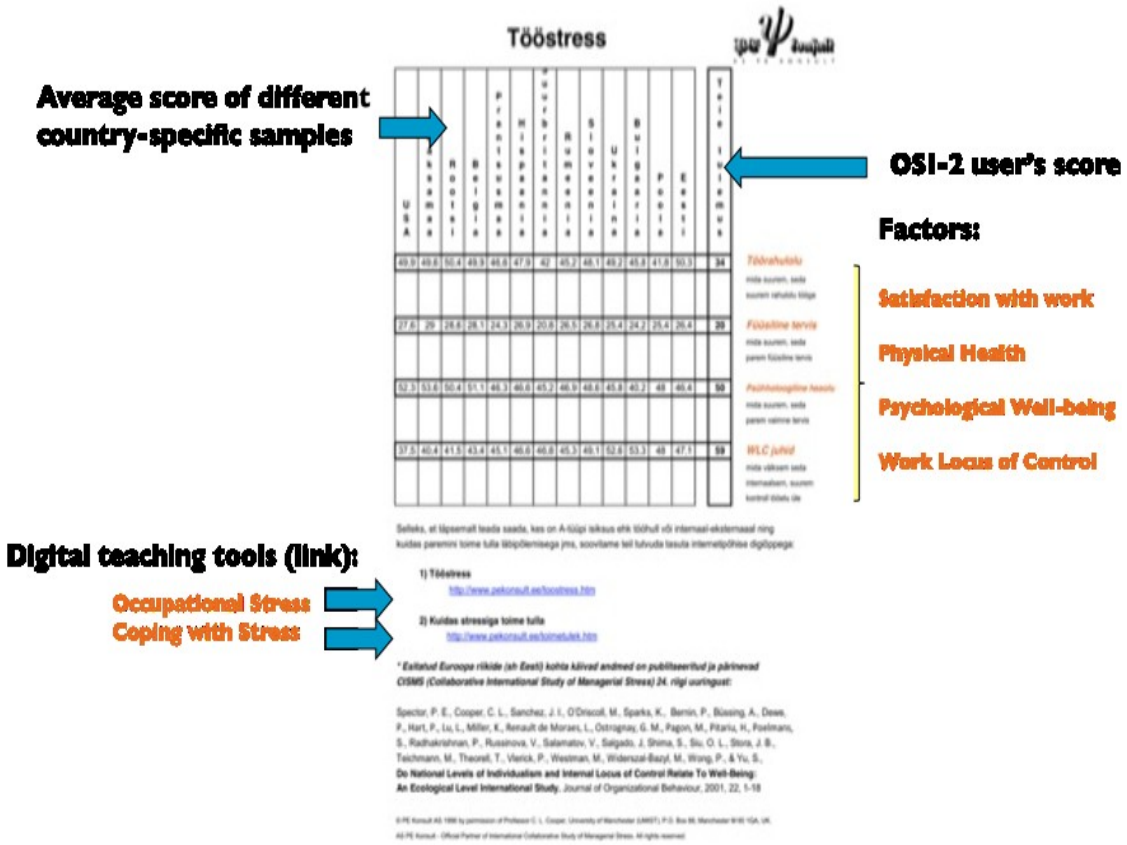
Validity and reliability

The validation data for the Occupational Stress Indicator (OSI-2) were collected with the help of Collaborative International Study of Managerial Stress (CISMS) founded in 1996 to conduct global research on job stress by pooling efforts of an international group of researchers. Participants of the CISMS study were 5,185 managers from 24 nations/territories. Validation evidence for the OSI-2 was summarised in various publications (such as Spector et al., 2001; 2002) and the coefficient alpha was between 0.78 to 0.88. The WLCS internal consistency (coefficient alpha) reported by Spector (1988) ranges of 0.75 to 0.85. From these data we conclude the scales are both reliable and valid.

Individual feedback for user

The user answers the OSI-2 test questions in the web environment. Processed results are sent individually to each user to their e-mail address within 2-3 minutes (see Figure 1 below). The internet links for access to e-learning facilities and the digital teaching tools “Occupational Stress” and “Coping with Stress” are attached to the test results that are returned to the user.

Figure 1: Individual Feedback for Users (an example of the first page)



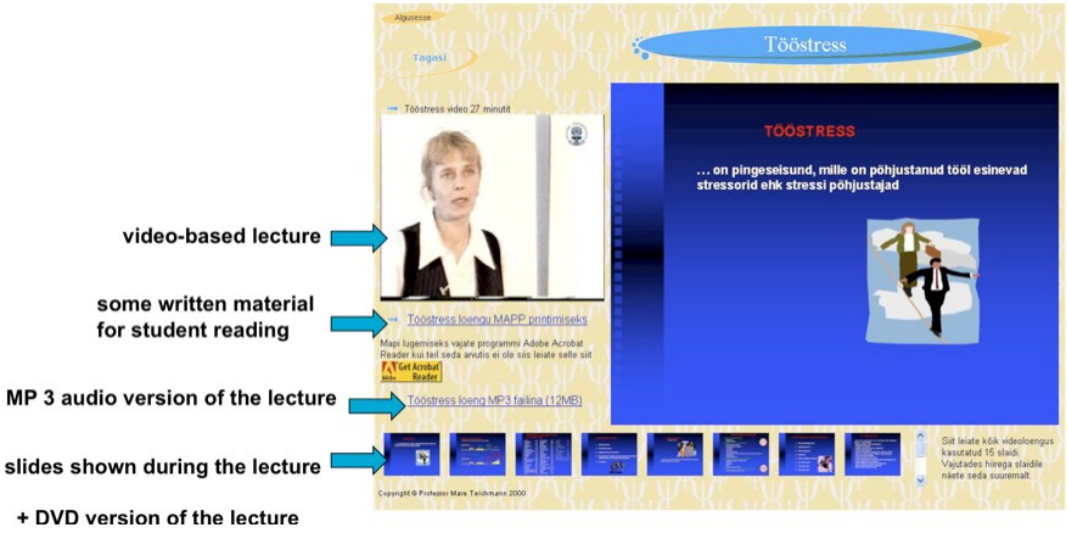
Digital teaching tools

These are video-lectures about stress at work addressing the theoretical background of occupational stress, burn-out, the occupational stress risk scale and stressors at work (see Figure 2 below). In addition, results from the OSI-2 agreggated at country level (Estonia) are provided to offer normative data for comparion. For example, indicaton of managers’ and teachers stress levels and stressors at work. The is no individual feedback in the digital teaching tool, as this is more about general knowledge for the participant to enable better

coping with occopational stress. Analysed are the results of OSI-2 and individual feedback for user. By adding the new knowledge from digital teaching tools (knowledge about occupational stress and coping with stress) the employee has the opportunity to make behavioural corrections in their everyday working life.

The digital teaching tool comprises of two video-lectures about occupational stress and coping strategies; describing aspects of problem-solving, social support, and time management. The video-lectures are supported by a copy of the slides and written materials for reading. A MP3 audio version and DVD option are available for users. An example is given in Figure 2 below.

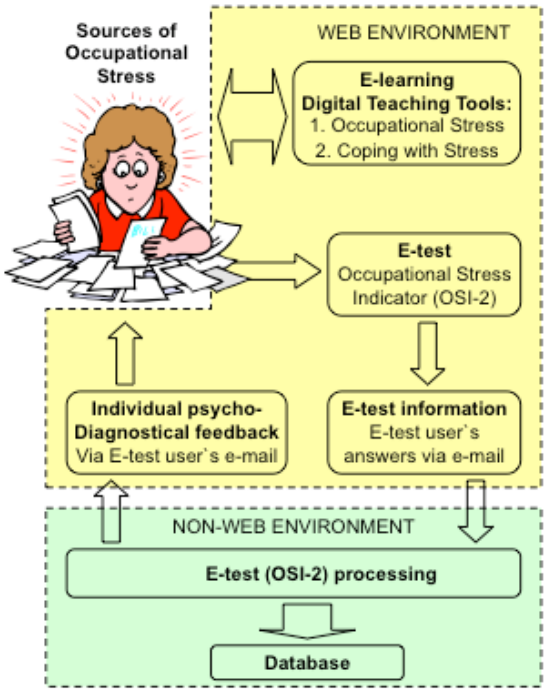
Figure 2: An example of the Digital Teaching Tool "Occupational Stress"



The procedure

The occupational Stress Indicator (OSI-2) is available for users in the Web environment. The user answers the OSI-2 test questions on-line and the test results are automatically sent to the recipient by e-mail once the user pushes the "send" button.

Figure 3: A flow diagram of the Web-Based Occupational Stress Prevention System



The user's answers are then removed from the Web environment since according to the test manual, processing of the OSI-2 test takes place outside the Web environment. There is guaranteed OSI-2 database security at least RAID 5 level. This ensures a copyright on the test key is not violated and the confidentiality of the user's test results is guaranteed.

Data of the final test results are copied into and kept in a database outside the Web environment. Processed results of the OSI-2 test are sent individually to each user within 2-3 minutes. The time delay occurs for security reasons as the test answers have to be copied into a database outside the Web environment, processed and copied again to a suitable format to be returned to the user (see the flow diagram in Figure 3). The length of the delay depends on the type of internet connection speed used by respondents.

Feedback from users

During the last three years 2,573 users have benefited from the Web-based occupational stress prevention system. Special study of users' feedback data were collected by the authors via the Internet from September to December 2008. Users were selected by random sample rules. The total sample consisted of 320 persons using the web-based occupational stress prevention system.

The rate of response was high; only 11 persons not giving answers to our short feedback questionnaire. The total sample (N= 309) consisted of 190 males (61%) and 119 females (39%) with an average age of 39.1 years (SD=10.37). The participants' educational level was: primary education 0.3%, secondary education 9.2%, vocational education 10.5%, and college graduates 79.9%. Their marital status was: single 15.9%, married 60.5%, cohabiting 17.8%, separated 1.3%, divorced 2.9%, and widowed 1.6%.

The feedback questionnaire consisted of six statements (for example, "Already I have suggested my friends or colleagues to use Web-based occupational stress indicator"; "This tool helped me to cope with occupational stress"; "I learned something new about occupational stress in video-lectures"). All items had five response choices from "strongly disagree" to "strongly agree". In addition, there was a possibility to give open answers, explanations or comments.

The feedback study shows users' positive attitudes towards web-based occupational stress prevention system. The users' evaluation and feedback for web-base occupational prevention system was highly positive - 4.6 points on a 5-point scale. The most frequently mentioned advantage of the system being that the user was not being dependent on location and time. He or she was free for choose when and where (at work, at home) they used the web-based occupational stress prevention system. Thus positive results should not be surprising, as quite often we get more personal and also very positive evaluation from web-based occupational stress prevention system users; many users show their gratitude and satisfaction by personal phone calls or e-mails.

The web-based occupational stress prevention system was founded as a non-profit initiative of an Estonian private company (PE Consult Ltd.) three years ago. The system will support a project entitled "Occupational stress study and web-based occupational stress prevention system for academic staff of Estonian universities (Acad OSI)" supported by Primus grant nr 3-8.2/23 from the European Social Fund.

References

Beehr, T.A. (1995). *Psychological Stress in the Workplace*, London, Routledge.

Cooper, C.L., & Dewe, P. (2004). *Stress: A Brief History*. Blackwell.

Hart, P.M., & Cooper, C.L. (2001). Occupational stress: toward a more integrated framework. In N. Anderson, D.S. Ones, H.K. Sinangil, C. Viswesvaran (Eds.), *Handbook of Industrial, Work and Organizational Psychology (2)*, London: Sage, pp. 93-114.

European Commission (1999). Guidance on Work-related Stress. Spice of Life – or Kiss of Death. *Employment and Social affairs, Health and Safety at Work,* European Commission.

Praxis (2002). *Estonian Mental Health Policy*, Center for Policy Studies, Tallinn, Estonia.

Spector, P.E. (1988). Development of the Work Locus of Control Scale. *Journal of Occupational Psychology, 61*, 335-340.

Sparks, K., Cooper, C.L., Spector, P.E., Sanchez, J. I., Bernin, P., Dewe, P., Hart, P., Lu, L., Miller, K., Renault de Moraes, L., O'Driscoll, M., Pagon, M., Pitariu, H., Poelmans, S., Radhakrishnan, P., Russinova, V., Salamatov, V., Salgado, J, Shima, S., Siu, O. L., Stora, J. B., Teichmann, M., Theorell, T., Vlerick, P., Westman, M., Widerszal-Bazyl, M., Wong, P., & Yu, S. (1999). The price of economic development: A 22 nation study of occupational stress in male and female managers. Unpublished manuscript. UMIST.

Spector, P. E., Cooper, C. L., Sanchez, J. I., O'Driscoll, M., Sparks, K., Bernin, P., Büssing, A., Dewe, P., Hart, P., Lu, L., Miller, K., Renault de Moraes, L., Ostrognay, G. M., Pagon, M., Pitariu, H., Poelmans, S., Radhakrishnan, P., Russinova, V., Salamatov, V., Salgado, J, Shima, S., Siu, O. L., Stora, J. B., Teichmann, M., Theorell, T., Vlerick, P., Westman, M., Widerszal-Bazyl, M., Wong, P., & Yu, S. (2001). Do National Levels of Individualism and Internal Locus of Control Relate To Well-Being: An Ecological Level International Study, *Journal of Organizational Behaviour, 22,* 1-18.

Spector, P. E., Cooper, C. L., Sanchez, J. I., O'Driscoll, M., Sparks, K., Bernin, P., Büssing, A., Dewe, P., Hart, P., Lu, L., Miller, K., Renault de Moraes, L., Ostrognay, G. M., Pagon, M., Pitariu, H., Poelmans, S., Radhakrishnan, P., Russinova, V., Salamatov, V., Salgado, J, Shima, S., Siu, O. L., Stora, J. B., Teichmann, M., Theorell, T., Vlerick, P., Westman, M., Widerszal-Bazyl, M., Wong, P., & Yu, S. (2002).). Locus of Control and Well-Being at Work: How Generalizable Are Western Findings? *Academy of Management Journal,* (2), pp 443-453.

Teichmann, M. (2004). Work and Stress: Estonian perspective. WHO European Ministerial Conference on Mental Health, WHO Pre-conference on Mental Health and Working Life, Tallinn, http://www.sm.ee/eng/pages/index.html

Teichmann, M., Spector, P.E., Cooper, C.L., & Sparks, K. (2005). Job stress and quality of life. In: F. Avallone, H. Kepir Sinangil, A. Caetano (Eds.), *Convivence in Organizations and Society*, Milano, Edizioni Angelo Guerini Associati SpA, pp. 179-187.

Teichmann, M., Spector, P.E., Cooper, C.L., Sparks, K., Bernin, P., Pagon, M., Pitariu, H, Polemans, S., Russinova, V., Salamatov, V., Salgado, J.F., Stora, J.B., Theorell, T., Vlerick, P., & Widerszal-Bazyl, M. (2006). Eastern European Managers versus Western Managers: Work Locus of Control, German 6th Congress on Work and Organisational Psychology, Leipzig, p.3, CD-ROM.

Teichmann, M.; & Ilvest, J. Jr. (2007). Engineers´ Occupational Stress and Stress Prevention System: E-psychodiagnostics and E-learning. In M. Iskander (Ed.), *Innovations in E-learning, Instruction Technology, Assessment and Engineering Education*. Springer, pp. 249-255.