International Journal of Occupational Safety and Ergonomics – rok 2010, ročník 16

Číslo 1

PROTECTION OF HUMAN IN THE WORKING ENVIRONMENT

Danuta Koradecka, Małgorzata Pośniak, Maria Widerszal-Bazyl, Danuta Augustyńska, Piotr Radkiewicz. *A Comparative Study of Objective and Subjective Assessment of Occupational Risk*. S. 3-22.

Measurements of dangerous, harmful and annoying factors in the working environment are used to assess occupational risk. Surveys on workers' subjective perception of risk are used, too. This study aimed to compare subjective assessment of work-related factors with their objective measurements and a national database on occupational risk. Spearman's correlation analysis, stepwise regression analysis and structural modelling were used to determine the relationship between subjective and objective risk assessment and to acquire knowledge about the role of psychosocial job characteristics as predictors of subjective assessment. Subjective assessment of hazards was related not only to their objective measurements but also to psychosocial job characteristics, workers' individual characteristics and work load. Even though subjective and objective assessments of hazard are strongly related, they are distinct phenomena. Hence, risk assessment should be carried out with both objective and subjective methods.

Český abstrakt: Cílem studie bylo srovnat subjektivní stanovení pracovních rizikových faktorů s jejich objektivním měřením a s národní databází profesionálního rizika. Bylo zjištěno, že subjektivní stanovení rizika má vazbu nejen na jeho objektivní měření, nýbrž i na psychosociální charakteristiky práce a pracovní zátěž. Stanovení rizika by mělo být prováděno objektivní i subjektivní metodou.

- **klíčová slova:** rizika - stanovení rizik - metody - měření - databáze - faktory rizikové

Elaine Y.L. Chong, Alan H.S. Chan. *Subjective Health Complaints of Teachers From Primary and Secondary Schools in Hong Kong*. S. 23-39.

This study aimed to investigate the subjective health complaints (SHC) in the teaching profession of Hong Kong. On the basis of the SHC inventory, a questionnaire was prepared for data collection through a mail survey. A total of 1 710 usable questionnaires were returned by the primary or secondary school teachers. The results showed that

99.5% (n = 1 702) of respondents suffered at least one type of the 39 single health problems on the total SHC scale during the preceding 30 days. The 10 most frequently reported health complaints among the teachers were tiredness, eyestrain, anxiety, sleep problems, voice disorder, shoulder pain, neck pain, headache, cold/flu, and lower-back pain. With the exception of the category of pseudoneurological complaints, primary school teachers showed a statistically higher prevalence in reporting problems in 6 of 7 subscales. The 5 most severe complaints were tiredness, eyestrain, sleep problems, shoulder pain, and voice disorder.

Český abstrakt: Na základě soupisu stížností učitelů škol 1. a 2. stupně v Hongkongu byl připraven dotazník pro sběr dat poštovní cestou. Nejvíce bylo stížností na únavu, námahu očí, úzkost, problémy se spaním, hlasové obtíže, bolesti ramen, šíje, hlavy a spodních zad a nachlazení. S výjimkou pseudoneurologických obtíží prokázali učitelé 1. stupně statisticky vyšší prevalenci v těchto problémech v 6 ze 7 podstupnic.

- **klíčová slova:** učitelé - školy základní - školy střední - obtíže zdravotní - dotazníky – Čína

Dorota Kondej, Tomasz R. Sosnowski. *Aerosol Generation and Identification for Model Studies of Particle–Lung Interactions*. S. 41-48.

This article discusses the idea and set-up of a laboratory system for generating reproducible concentrated occupational aerosols containing metal compounds. Dust representatives for 2 metal-machining workstations (an electric grinder and an electric disc cutter) were released from a fluidized-bed generator, and then sampled and compared in respect to concentration, particle size distribution, particle morphology and the content of metal elements (Fe, Al, Cu, Mn, Cr, Ni, Pb, Zn, Mg). The results indicate the presence of a significant number of irregularly-shaped respirable particles. Those particles contained mainly Fe and Al, and their composition was shown to depend on particle size. The proposed system of aerosol generation and collection can be used in studies of interactions between airborne particles and a model lung surfactant.

Český abstrakt: Článek diskutuje myšlenku a situaci laboratorního systému pro tvorbu reprodukovatelných koncentrovaných profesionálních aerosolů obsahujících kovové složky. Výsledky výzkumu prokázaly přítomnost významného počtu nepravidelně tvarovaných dýchatelných částic, které obsahovaly především Fe a Al a jejich složení záviselo na velikosti částic. Navrhovaný systém lze používat.

- **klíčová slova:** aerosoly - částice - interakce - plíce - kovy - železo – hliník

Kaveh A. Sanati, Ghasem Yadegarfar, Hamidreza Naghavi, Massoud Mansouri, Javad G.H. Sanati. *Temporal Trend of Occupational Injuries; First Versus Second Half of a Working Shift*. S. 49-54.

Objectives. To assess occupational injuries in the 1st versus 2nd half of a working shift in terms of (a) the likelihood of hospital referral following an injury event; (b) the external causes of injuries. **Methods.** Logistic regression analyses of data from a 16-year (1991–2007) experience of ongoing surveillance of occupational injuries in a synthetic fiber factory in Iran. **Results.** The likelihood of a hospital referral following an injury in the 1st half of a shift was higher than in the 2nd half (adjusted odds ratio [OR] 1.50, 95% confidence interval [CI] 1.10–2.00). Comparing the 2 halves of the shift, an injury occurring in the 2nd half was more likely to be due to exposure to smoke, fire and flames (OR 2.34, 95% CI 1.06–5.19) or transport accidents (OR 1.84, 95% CI 1.06–3.21). **Conclusions.** Time-specific safety interventions could be used in the risk management of occupational injuries. Further studies to investigate the effect of time-dependent interventions are recommended.

Český abstrakt: Studie zkoumala úrazy z hlediska a) pravděpodobnosti počtu hospitalizovaných pacientů po úraze; b) vnějších příčin zranění. Bylo zjištěno, že počet pacientů po úraze v 1. části směny byla vyšší než ve 2. části. Ve 2. části bylo pravděpodobnější, že k úrazu dojde po expozici kouři, ohni a plamenům nebo při dopravních nehodách. Jsou doporučeny další výzkumy.

- **klíčová slova:** úrazy pracovní - směny pracovní - práce na směny - pravděpodobnost - pacienti – nemocnice

PROTECTION OF HUMAN AT THE WORKSTATION

Jonathan Bohm, Don Harris. *Risk Perception and Risk-Taking Behavior of Construction Site Dumper Drivers*. S. 55-67.

In the UK construction site dumpers cause more serious accidents than any other type of construction plant. Previous research has indicated that driver behavior plays a pivotal role in the vast majority of these accidents. This study used a paired comparison technique to explore dumper drivers' and subject matter experts' (SMEs') risk perception and its relationship to risk-taking behavior. It was found that driver risk perception significantly differed from measures of "objective risk", derived from accident data and also from SMEs' risk perception. Furthermore, drivers still engaged in undertaking perceived high risk behaviors. The results suggest that driver risk perception was linked to the "perceived dread" of an accident, rather than its likelihood and that risk-taking behavior was often driven by situational factors, such as site safety rules or the behavior of other personnel on the site, together with an overarching culture that prioritizes production over safety.

Český abstrakt: Studie použila párovou srovnávací techniku k výzkumu vnímání rizika u řidičů nákladních automobilů se sklápěči a jejich vztahu k chování při přijetí rizika. Bylo zjištěno, že vnímání rizika u řidičů se významně liší od míry "objektivního rizika" odvozené z údajů o úraze a z vnímání rizika. Výsledky ukázaly, že vnímání rizika u řidičů má vazbu na "pociťovaný strach" z úrazu.

- **klíčová slova:** řidiči - automobily nákladní - sklápěče - psychologie práce - rizika – vnímání

Somnath Gangopadhyay, Banibrata Das, Tamal Das, Goutam Ghoshal, Tirthankar Ghosh. *An Ergonomics Study on Posture-Related Discomfort and Occupational-Related Disorders Among Stonecutters of West Bengal, India*. S. 69-79.

Stonecutting and setting are important tasks in a construction site. A field study was conducted to assess occupational-related disorders and to conduct ergonomics assessment among stonecutters. The study focused on (a) the duration of work per day, (b) the working environment and working activities and (c) the feeling of discomfort in different parts of the body. A detailed posture analysis was performed with the Ovako working posture analysis system (OWAS). It was observed that stonecutters worked continuously in awkward postures during stonecutting and setting. Consequently, they suffered from discomfort in different parts of their body, specifically in the lower back, knees and shoulders, which mainly prevented them from continuing their work. This study also revealed that stonecutters had to work in congested work areas with a poor level of illumination. The noise level and dust particles emitted during stonecutting activities could affect stonecutters.

Krystyna Zużewicz, Maria Konarska, Anna Łuczak. *Injured Professional Drivers in Poland : an Analysis of the Causes and Effects in Relation to the Time of the Road Accident*. S. 81-91.

Introduction. The objective of the paper was to present the results of an analysis of road accidents in professional drivers in Poland, from the point of view of their age, tenure, accident causes and effects in relation to the time of the accidents they were involved in. **Method.** Data were obtained from a database of the Central Statistical Office. Accidents recorded in statistical accident cards from 6 consecutive years were analysed. **Results.** The overall number of injured professional drivers generally decreased over the 6 years, except for the last year of the period when the tendency to fatal and severe accidents between 23:00 and 6:59 increased. The highest percentage of fatal and severe accidents was found between 23:00 and 6:59 and was caused by medical emergencies and unsafe behaviour. The tenure of 70.89% of the injured drivers was under 10 years. Drivers who had worked for over 20 years had fewest injuries between 23:00 and 6:59. **Conclusion.** The results of the analysis may be used in changing work schedules to reduce the accident risk of the occupational groups at greatest risk.

Český abstrakt: Cílem studie bylo podat výsledky analýzy úrazů z hlediska věku, délky držení vozidla, příčin nehod a jejich následků během 6 po sobě jdoucích let. Bylo zjištěno, že počet zraněných řidičů klesá během těchto 6 let, s výjimkou posledního roku období, kdy stoupá tendence k závažným a smrtelným úrazům mezi 23,00 a 6,59. Ti, kteří pracovali přes 20 let, mají v této době nejméně úrazů.

- **klíčová slova:** řidiči - nehody dopravní - analýzy nehod - věk – Polsko

Heli Koskinen, Esko Toppila, Pekka Olkinuora. *Facilities for Music Education and Their Acoustical Design*. S. 93-104.

Good rehearsal facilities for musicians are essential. Directive 2003/10/EC necessitates that musicians are protected from noise exposure. A code of conduct gives the guidelines how this should be done. This study examines room acoustics recommendations provided by the Finnish code of conduct, and discusses whether they are adequate. Small teaching facilities were measured after renovation and compared to earlier measurements. Teachers' opinions were inquired about the facilities before and after. The renovation did not decrease the noise exposure of the teachers. However, the majority preferred the facilities after the renovation. The Finnish code of conduct is not sufficient for facilities where loud instruments are played, or band practise. Good facilities can be designed but they must be specified at the designing stage for their intended use.

Troy Jones, Shrawan Kumar. *Comparison of Ergonomic Risk Assessment Output in Four Sawmill Jobs*. S. 105-111.

The objectives of this study were to examine the agreement between 5 ergonomic risk assessment methods calculated on the basis of quantitative exposure measures and to examine the ability of the methods to correctly classify 4 at risk jobs. Surface electromyography and electrogoniometry were used to record the physical exposures of 87 sawmill workers performing 4 repetitive jobs. Five ergonomic risk assessment tools (rapid upper limb assessment [RULA], rapid entire body assessment [REBA], American conference of governmental industrial hygienist's threshold limit value for mono-task hand work [ACGIH TLV], strain index [SI], and concise exposure index [OCRA]) were calculated. Dichotomization of risk to no risk and at risk resulted in high agreement between methods. Percentage of perfect agreement between methods when 3 levels of risk were considered was moderate and varied by job. Of the methods examined, the RULA and SI were best (correct classification rates of 99 and 97% respectively). The

quantitative ACGIH-TLV for mono-task hand work and Borg scale were worst (misclassification rates of 86 and 28% respectively).

Český abstrakt: Cílem studie bylo vyzkoumat shodu mezi 5 metodami stanovení rizika na základě kvantitativní expozice a vhodnost těchto metod ke správné klasifikaci čtyř rizikových profesí. Bylo použito pět nástrojů stanovení rizika. Procento dobré shody mezi metodami, kdy byly vzaty v úvahu tři úrovně rizika, nebylo velké a měnilo se podle profese.

- **klíčová slova:** pily - rizika bezpečnostní - rizika pracovní - stanovení rizik - ergonomie – profese

REVIEW

Rima R. Habib, Fadi A. Fathallah, Karen Messing. *Full-Time Homemakers: Workers Who Cannot "Go Home and Relax"*. S. 113-128.

This paper examined how musculoskeletal disorders (MSDs) of female homemakers were studied in the literature. It also presented preliminary findings from field observations of housework and fulltime homemakers in urban settings. PubMed, Ergonomics Abstracts, Sociofile, and PsycINFO databases were used in the literature search. The review focused on comparing demands of housework and paid work. Also, exposure factors found in studies of various occupations were compared with the results of field observations of housework in 4 homes in Beirut, Lebanon. Few studies systematically examined associations between MSDs and risk factors in housework. Some well-known risk factors for MSDs were identified in the Beirut homes; however, other unique factors were noted. Housework activities expose homemakers to known risk factors for MSDs, which calls for further studies to identify appropriate intervention and prevention strategies.

Český abstrakt: Je podán přehled toho, jak jsou muskuloskeletální obtíže žen pracujících doma zkoumány v literatuře. Rovněž jsou předložena předběžná zjištění terénních studií práce doma. Byly použity tyto databáze: PubMed, Ergonomics Abstracts, Sociofile a PsycINFO. Byly srovnávány požadavky z hlediska práce doma a placené práce. Studie různých zaměstnání byla srovnána s výsledky získanými ve 4 domácnostech v Bejrútu.

- **klíčová slova:** ženy - práce žen - práce doma - obtíže zdravotní - svaly - kostra - onemocnění muskuloskeletální - přehledy - Asie