

0242 IMPACT OF OCCUPATION ON BLOOD LEAD LEVELS IN PREGNANT WOMEN

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Objectives To examine the relationship between occupation and blood lead levels in pregnant women of Durango, Mexico.

Method A cross sectional study was conducted with 299 pregnant women. Information on occupation, risk factors and socio-demographic data was collected by means of a structured questionnaire. Blood lead concentration was tested by graphite furnace spectrometry. Women were divided into three groups according to occupation: working in places with potential source of lead exposure (exposed group), working in places without lead exposure (control group I), and non-working women (control group II). The X^2 test was used to assess statistical differences between the groups, and one way ANOVA was applied for comparisons. Logistic regression was performed using blood lead $< 5 \mu\text{g/dL}$ or $\geq 5 \mu\text{g/dL}$ as dependent variable, and adjusted for jurisdiction, income, gestational age, and abortions.

Results Only 24(8%) women worked in places with potential source of lead exposure, 47(15.7%) worked in other places, and 228(76.3%) did not have a remunerated job. Mean blood lead concentration in the study sample was $2.79 \mu\text{g/dL}$. However, blood lead $\geq 5 \mu\text{g/dL}$ accounted for 25% of exposed women, 2.1% of control group I, and 6% of control group II ($X^2 = 13.04$; $p = .001$). Mean blood lead level was $4.24 \mu\text{g/dL}$ in the exposed group, $2.31 \mu\text{g/dL}$ in the control group I, and $2.74 \mu\text{g/dL}$ in the control group II; those differences were statistically significant (0.001). Logistic regression confirmed that blood lead $\geq 5 \mu\text{g/dL}$ is associated with occupational exposure ($p = 0.036$). **Conclusions** Our findings suggest that surveillance for occupational exposure to prevent health damages during pregnancy is needed.

0243 SCREENING AND DISABILITY PREVENTION FOR MUSCULOSKELETAL DISORDERS OF HIGH-TECH INDUSTRY WORKERS IN TAIWAN

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Objectives In Taiwan, 40–60% of the working population is affected by musculoskeletal disorders (MSD). MSD may lead to reduced productivity, decreased work ability, and even disability. The aim of this study was to describe the effects about occupational health medical team preventing and management of MSD. **Method** The design was prospective study describing the high-tech industry workers screening and disability prevention for MSD. The quantitative analysis of the questionnaire was conducted through descriptive statistics and pair-t test in order to indicate the direction and relationship between the two sets of occupational health medical team intervention program.

Results Of the 386 high-tech industry workers who completed the questionnaire. The use of pair-t test comparing two months of occupational health medical program, individual symptom scores significantly decreased 1.99 points to 6.12 points. The degree of functional subjects increased from 57% to 74%, a significant improvement. Work ability index before treatment was 38.49 to 39.36 points after treatment improved, particularly in

the self-evaluation and self-ability and physical work / effort needs very significant improvement in symptoms improve work ability index, increased efficiency and productivity. Subjects original degree of disability is about 22.33%, significantly decreased to 18.1% after treatment.

Conclusions Early worksite screening and intervention for MSDs performed by occupational health medical team intervention program were effective on improving the work ability and the functional level. This service may also prevent worsening of the MSDs, and lead to significant reductions in occupational disorders, decreased health care costs, and improvements in production efficiency.

0246 WEEKEND WORK AND PSYCHOSOCIAL WELL-BEING IN KOREAN WORKERS

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Objectives To identify association between weekend work and psychosocial well-being in a representative sample of Korean workers.

Method We analysed the associations between weekend work and psychosocial well-being in 29 711 workers using data from the 2011 Korean Working Conditions Survey. Weekend work was defined by working one or more day on Saturday or on Sunday over the last month. Psychosocial well-being was measured by WHO well-being index. Multiple logistic regression analysis was performed adjusting age, education, income, regular/non-regular work, working time with stratifying sex and shift-work.

Results The prevalence of weekend work was higher in male (62.4%) than in female (54.8%). The longer working time per week, the more employees worked weekend [<40 (42.6%), 40–48 (45.3%), 49–60 (80.6%), ≥ 61 (94.9%)]. Shift workers (87.3%) worked more than non-shift workers (56.2%) on weekend. In non-shift workers, weekend work group (≤ 4 days) [OR=1.34 (95% CI 1.22–1.48), OR=1.17 (95% CI 1.05–1.31)] and weekend work group (>4 days) [OR=1.19 (95% CI 1.03–1.38), OR=1.30 (95% CI 1.10–1.52)] were significant risk factors associated with lesser psychosocial well-being in male and female respectively.

Conclusions Weekend work is associated with a significant increase in lesser psychosocial well-being among Korean non-shift workers.

0247 EVALUATION OF SHIFT FATIGUE AND PHYSICAL HEALTH INTERVENTION IN PAPER MANUFACTURER OF WORKERS

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Objectives Shift and fatigue is one the most easily neglected health issues in occupation safety. The purposes of the study were to develop convenient method to evaluate the sources of fatigue in worksite and develop a physical health promotion program.

Method The design was prospective study describing the paper manufacturer workers. Use myoton measurement muscle stiffness and elasticity. The quantitative analysis of the three

categories: managed, labour and repetitive motion types through descriptive statistics and two way ANOVA. Indicate the relationship between the two sets of 8 weeks of physical health intervention program.

Results Stress and lack of sleep were the sources of fatigue. The degree of discomfort in neck and shoulder and low back were related to the level of fatigue. There was a significant decrease in lower limb and back muscle stiffness and an increase in muscle elasticity measurements after physical health promotion program. Managed workers showed muscle tension is greater than the vertical type of labour.

Conclusions A well planned physical health program specifically designed the needs for the workforces can effectively change the perception of fatigue and reduce the level of muscle stiffness. Such promotion model can be further utilised in other occupational worksites.

0248 PREDICTING PHYSICIAN'S DUTY STRESS BY PARASYMPATHETIC NERVOUS FUNCTION (ALSO TO BE CONSIDERED FOR MINI-SYMPOSIUM: EARLY DETECTION AND MANAGEMENT OF WORKERS UNDER STRESS)

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Objectives Early stress markers are useful in detecting workers with occupational stress. The aim of this study was to determine whether heart rate variability was associated with physicians' duty loading, and also a good predictor for stress markers.

Method An observational study on physicians with variable duty loading was conducted in a secondary referral medical centre in northern Taiwan in 2012. For every participant, 24-hr electrocardiography (EKG) and hourly blood pressure were obtained during three test days, i.e., regular-duty (only day shift), moderate-duty (day and night-shift with moderate number of patients cared), and high-duty days (day and night-shift with higher number of patients cared). Blood samples for stress markers were obtained at 8 am on the test day, and 8 am on the second morning.

Results A total of 12 staff physicians satisfactorily completed the study. The number of patients covered at night shift was $0, 92 \pm 8$, and 187 ± 9 , for regular-, moderate-, and high-duty nights, respectively. Total phone calls, urgent procedures, new patients admitted, critical patients cared and times of awakenings were significantly higher as the duty loads increased. The parasympathetic indicator derived from continuous EKG, high frequency normalised unit (HFnu), was negatively related to loading of total patient cared ($P < 0.0001$). Reduced HFnu predicted elevated night systolic blood pressure ($P = 0.016$) and serum uric acid ($P = 0.024$), and 24 h urine vanillylmandelic acid ($P = 0.0045$), dopamine ($P = 0.011$), and norepinephrine ($P = 0.027$).

Conclusions HFnu derived from heart rate variability measurement may predict several important stress markers during night-shift duties.

0249 DETERMINANTS OF OCCUPATIONAL HYGIENE EXPERT JUDGMENT ACCURACY

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Objectives A cross sectional study was performed to determine the applicability and accuracy of expert judgment in occupational exposure assessment. The roles of educational session and determining factors were also realised.

Method Thirteen occupational hygienists were divided into two groups based on their field experience. They asked to evaluate exposure intensity in seven operating units in a tile factory before and after exposure training session. Participant's judgments were compared to actual air sampling data in the factory; and relative errors were calculated. Inter-class correlation coefficients were calculated and relative errors compared according to participants characteristics. Stepwise regressions were performed to investigate the defining variables.

Results In all situations there were almost perfect agreement ($ICC > 0.80$) among raters. Correlations between estimated mean exposure and relative percentage error of participants before and after training were significant at 0.01 (correlation coefficients were -0.462 and -0.443 respectively). Results showed that actual concentration and experience resulted in 22.4% prediction variance for expert error as an independent variable.

Conclusions Correctness of exposure ratings by hygienists was susceptible to error from several sources. It seems that experienced subjects had better ability to predict the exposures. In general, in lower concentrations, the rating error increased significantly. Leading causes of judgment error should be taken into account in epidemiological exposure assessment studies.

0250 OCCUPATIONAL EXPOSURE AND STROKE - A CRITICAL REVIEW OF CHEMICAL AND PHYSICAL EXPOSURES

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Objectives Stroke is the third most common cause of death in developed countries, exceeded only by coronary heart disease and cancer. There is substantial scientific literature on the association between occupational exposures and coronary heart disease, but much less is known about stroke. This systematic critical review was performed to assess the strength of evidence for causal associations between chemical and physical occupational exposures and stroke.

Method Literature on stroke incidence or mortality and occupational factors published up to 2012 was identified from Medline and Scopus. The 4 471 abstracts were evaluated independently by two reviewers. 29 studies relevant to chemical and physical exposures were identified; ionising irradiation (7 studies); carbon disulfide (4), dynamite (3), motor exhaust (7) and other combustions products (8). The evidence for an association was assessed according to defined criteria as strong, moderate, limited, or insufficient.