

**4th International Conference on
Work Environment and Cardiovascular Diseases**

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Newport Beach, California

Conference Abstracts

Session: W12

Abstract No: 001

Author(s): Aleck Ostry

Title: Job Strain, Effort -reward Imbalance, Organizational Justice, Work Life Imbalance and Body mass Index among Australian Workers

Format: Paper

Although the prevalence of overweight and obesity have been high since the early 1950s these rates have increased rapidly since the early 1990s with particularly worrying increases among children. Australia, like most developed industrial nations has not escaped this phenomenon. While overweight and obesity are seen as a major risk factor for cardio-vascular disease, diabetes, and cancer very little research has been conducted on the relationship between work experience and body mass index.

Utilizing a representative sample of approximately 1100 workers in the state of Victoria in Australia we have analyzed the associations between job strain, effort-reward imbalance, organizational justice, and work-life balance and body mass index. The prevalence of underweight among women was 5.7 compared to 1.1 percent among males. The prevalence of obesity (defined as BMI>30) was 13.3 percent for men and 11.5 percent for women. Almost all underweight women were less than 25 years of age.

After controlling for age, education and marital status, we found that, among women, the odds of being under-weight (BMI <18.5) were 4.3 for those in jobs characterized by low control and 2.0 for those in jobs characterized with low procedural justice. Similar analyses for males was not possible because of the low prevalence of under-weight among men.

After controlling for age, education, and marital status, the odds ratio for obesity were 2.1 for males in active jobs, 1.1 for those in jobs characterized by high efforts, 1.6 for those with high "over-commitment", and 1.9 for those with high work/life imbalance. Similar analyses undertaken for women produced no associations between job conditions and obesity.

These analyses indicate that:under-weight may be a problem for a sizeable proportion of the Australian female labour force and that the odds of being underweight were significantly elevated among women in jobs characterized by low control or low procedural justice. Adverse psychosocial work conditions were not associated with obesity among women. However, among males, elevated odds for obesity were associated with psychosocial work conditions characterized by high effort, over-commitment, and high work/life imbalance. Both under-weight and overweight are risk factors for cardio-vascular disease.

Session: F11

Abstract No: 002

Author(s): Bo Netterstrøm

Title: Self-reported job strain increases the risk of ischaemic heart disease: a 14-year cohort study of employed Danish men

Format: Paper

Background: Thirty-five longitudinal studies describing the relationship between psychosocial factors at work and ischaemic heart disease (IHD) have been published (double publications excluded). Ten out of 18 cohort studies and 15 out of 17 case control studies found a significant association between psychological work strain and IHD. In three of the studies, the results showed the expected association without it being significant, and in seven studies no association was found. Nineteen of the studies had used the job strain model suggested by Karasek and Theorell as the measure of exposure. Eleven of these found a clear association between job strain and IHD, three found a partial association, and five showed negative results. Three of the negative studies had used the ecological method as the measure of exposure. Effort-reward imbalance and long working hours were found to further increase the risk of IHD in the three American and three European studies, which had looked into these exposures.

Aims: To test the relation between job strain and the incidence of IHD prospectively in Denmark.

Methods and Results: As a part of the WHO-initiated MONICA II study , a clinical examination was undertaken of 659 men, without known ischaemic heart disease (IHD), together with a questionnaire-based evaluation of living conditions and psychosocial factors at work, including items identified in the Job Strain Model. An objective classification of the components in the Job Strain Model was made by utilising the participants' job title and the principles guiding the payment of their salaries/wages. In addition, a questionnaire-based subjective classification was undertaken. All participants were followed until the end of 1999 with regard to hospitalisation and death due to IHD. Stepwise analyses were made, adjusting for age, social class, social network and conventional behavioural and physiological coronary risk factors. Self-reported high job strain was significantly associated with IHD independent of conventional coronary risk factors. High demands contributed in particular to this result. The study did not support the job strain hypothesis when an objective classification of the components in the Job Strain Model was applied. This is in accordance with the majority of other studies in this area. An unexpected finding was that the incidence of IHD was highest among employers and managers.

Conclusion: Job strain is a risk factor for IHD, a fact which should affect the primary and secondary prevention of IHD.

Session: W14

Abstract No: 003

Author(s): Sharon Toker

Title: The association between burnout, depression and anxiety, and inflammation biomarkers: C-reactive protein and fibrinogen: Comparing gender differences

Format: Paper

Employee burnout or vital exhaustion (a related construct) was found to be associated with several risk factors for cardiovascular disease [CVD] and with CVD. We investigated the possibility that a mechanism linking burnout with CVD morbidity is low-grade inflammation, gauged in this study by C- reactive protein [CRP] and fibrinogen.

Our sample included 630 women and 933 men undergoing periodic health examinations, all apparently healthy. In the analysis, we controlled for possible confounders including age, BMI, blood lipids (HDL & triglycerides), glucose, systolic blood pressure, smoking status, sport intensity and estrogen use in women. In addition, we controlled for two other negative affective states: depression and anxiety.

In women burnout was positively associated with CRP and fibrinogen levels, and anxiety was associated with lower levels of CRP and fibrinogen. In men, depression, but not burnout, was positively associated with elevated levels of CRP and fibrinogen. Thus, burnout, depression and anxiety are differentially associated with inflammation biomarkers, dependent upon gender.

Session: T13

Abstract No: 005

Author(s): Ghasem Yadegarfar

Title: Shift work, death from ischaemic heart disease, social class and healthy shift worker effect

Format: Paper

Objective: To investigate the relationship between shift work and death from ischaemic heart disease (IHD) and the effects of social class and healthy shift worker effects on this relation.

Methods: A nested case-referent study within an industrial cohort of men was used. Setting: A site of a nuclear fuel company in the North-West of England. Cohort consisted of workers who joined a site of a nuclear fuel company in the North-West of England aged 50 years old or under between 1 January 1950 and 31 December 1998 and worked there at least 30 days. Cases (635 workers) were all cohort members who died of ischaemic heart disease (ICD 410-414) in the period 1950-1998 aged 75 or under. For each case, a referent worker who was alive at the time of the cases' death was chosen from the cohort, matched on age and the year of starting work at the same site, with a maximum difference of five years being allowed on each variable. Deaths from ischaemic heart disease were coded from the death certificate. Work status (shift work or day work) and duration of shift work was determined for cases from their total employment, and for referents for employment up to the time of the corresponding case's death. The main source of information was historical personnel records, including pay codes which differed for day work and shift work. Pre-employment weight, height, systolic and diastolic blood pressures and smoking extracted from each worker's medical records were considered as confounding factors. Social class at first employment was considered as a specific potential confounder and extracted from job titles and job codes. Conditional logistic regression analysis was used to estimate odds ratios (ORs). Bias due to selection into was also addressed by comparing relative risks (RR) immediately after the employment and after 10 years follow-up. Selection-out bias was addressed by examining the differences in RR based on activity at the time of cases death and RR for long-term shift workers with day workers.

Results: 55% of subjects had been worked as shift workers for at least 30 days. There was evidence that shift workers had relatively better health at the start of employment. Among referents, 78% and 41% of shift and day workers belong to either social class-4 or social class-5 respectively. The odds ratios for shift workers compared to day workers, after adjustment for SBP, DBP, body mass index, height, smoking, duration of employment, employment status and restricted to those who survived 10 years after hire were 1.11 (90% CI: 0.90 – 1.37). This relative risk decreased to 1.05 (90% CI: 0.84 – 1.31) after inclusion of social class. There was no relationship between risk of death from IHD and duration of shift work.

Session: F21

Abstract No: 006

Author(s): Els Clays

Title: Associations between Job Strain and Ambulatory Blood Pressure

Format: Paper

Introduction: It has been suggested that psychosocial job stress is associated with elevated blood pressure and by this mechanism with increased risk of cardiovascular disease. Studies linking job strain to casual blood pressure measurements are generally not very convincing, while results tend to be more consistent when ambulatory blood pressure is measured. Within a subsample of the Belstress study, ambulatory blood pressure was monitored and related to self-perceived job stress.

Methods: The results presented here relate to preliminary observations in 126 subjects (65% male, mean age 52 years), half of whom are labelled as having high strain according to Karasek's Demand-Control model (combination of high psychological job demands with low decision latitude). Participants were carrying a 24 hour ambulatory blood pressure monitor (using Spacelabs Medical, Inc. device) on a regular working day. Additionally, they wore an activity monitor (using Computer Science and Applications, Inc. device) which records accelerations of the body. In analyses of variance, mean ambulatory blood pressures – averaged over 24 hours and separately for the time spent at work, at home and during sleep - were compared between job strain groups.

Results: Mean systolic and diastolic blood pressure - averaged over 24 hours as well as separately for the time spent at work and during sleep - is significantly higher in people with high job strain ($p < 0.05$). These associations are independent from age, gender, body mass index, smoking status, educational level, occupational status, company, perception of stress outside work and mean level of physical activity prior to blood pressure measurements. The difference in mean blood pressure between the high strain group and the others is proportionally highest with respect to systolic blood pressure at work (133.9 vs 128.7 mmHg) and diastolic blood pressure during sleep (69.6 vs 66.2 mmHg).

Conclusions: Within the entire Belstress study population, no consistent relations were found between job strain and casual blood pressure readings. Our results with ambulatory monitoring suggest that the perception of high psychological demands combined with low decision latitude is associated with elevated systolic and diastolic blood pressure. It is important to notice that the adverse effect of high job strain on blood pressure is not only present throughout the working hours, but even during the time asleep.

Session: F11

Abstract No: 007

Author(s): Els Clays

Title: Perceived Job Stress and incidence of coronary events: Three year follow-up of the Belstress cohort

Format: Paper

Introduction: Individual psychosocial characteristics have been linked to coronary heart disease (CHD). We examined the independent role of perceived job stress on the short-term incidence of clinical manifest coronary events in a large occupational cohort.

Methods: The study sample consisted of 14,337 men aged 35-59 years employed in a wide range of occupations. Subjects completed the Job-Content Questionnaire to determine the three dimensions of the extended job strain model, namely 'job demands', 'decision latitude' and 'social support'. Jobs were further categorized into high strain, low strain, active and passive jobs. Subjects were followed up during 3 years for new clinical manifestations of CHD.

Results: At baseline, 26% of employees could be labelled as experiencing low strain while 17% were classified in the high strain category. A high job strain exposure in conjunction with a low level of social support was found in 11%. During the observation period, 87 coronary events were registered. According to Cox modelling the impact of job demands and decision latitude on the development of CHD was not significant after adjustment for covariates. The risk excess of 38% observed among subjects classified in the high strain category did not reach statistical significance. However, the incidence of coronary events was substantially associated with the social support scale independently of other risk factors with an adjusted hazard ratio (95% CI) of 2.4 (1.4-4.0) between extreme tertiles.

Conclusion: Despite some apparent trends, no convincing evidence for an association between job demands, decision latitude or job strain and the short-term incidence of hard CHD endpoints was found. However, our study underscores the major importance of a supportive social environment at the workplace by co-workers and/or supervisors in the prevention of coronary heart disease.

Author(s): Olutayo Ifedayo Ajayi

Title: ALTERED FIBRINOLYTIC RESPONSE IN NIGERIAN LONG DISTANT DRIVERS

Format: Paper

BACKGROUND: Exercise has been defined as physical activities designed to develop muscular strength or endurance, joint mobility and cardiovascular fitness. It has been linked with improved rheologic properties and blood flow. However, this is presumed to be deficient in this group of subjects.

AIM: This study was therefore designed to evaluate the rheologic fitness of long distant drivers in relation to their cardiovascular activities.

METHODS: A total of 100 long distant male motor drivers and 50 apparently healthy individuals (Controls) who drives sparingly were studied. They include drivers covering an average distance of 700 kilometres daily and have been driving for a minimum period of 3 years. Their blood samples were obtained for haemorheological parameters of Haematocrit (HCT), Erythrocytes sedimentation rate (ESR), Whole blood and Plasma viscosities WBV and PV), plasma Fibrinogen concentration (PFC) and Euglobulin lysis time (ELT) using standard methodologies. Their blood pressures (BP) were also estimated while student t-test was used for statistical analysis.

RESULTS: There were statistically significant increase in all the parameters measured ($P < 0.05$ respectively) except ESR, though increase in value but not significant. The increased ELT indicates a hypofibrinolytic activity. Also, there were statistically significant increases in both systolic and diastolic pressures.

CONCLUSION: Increased haematocrit coupled with hyperviscosities and hyperfibrinogenaemia with a concomitant hypofibrinolytic activity are abnormal rheologic indices and could be dangerous signals for impaired cardiovascular function as evidenced by raised diastolic and systolic blood pressures in long distant drivers.

Session: F13

Abstract No: 010

Author(s): Siavash Banaee

Title: The association between thermal conditions and cardiovascular diseases among Iran and steel industry workers

Format: Paper

Introduction: Human activities have influenced the environment since the first settlements were built and the land cultivated. At that time, the changes were relatively small and were absorbed by the resilience of the environment. Changing thermal conditions can be expected to influence human health and wellbeing in proportion to the degree of heat stress. In healthy individuals, an efficient heat regulatory system will normally enable the human body to cope effectively with a moderate rise in ambient temperature.

The purpose of this research is to define the relation between heat stress and cardiovascular diseases (CVD) in work environment. The study is performed in an iron and steel industry in Iran, which is the largest one in the Middle East with a population of about 28,000.

Methods and Results: According to the American Conference of Governmental Industrial Hygienists Standards, we used WBGT (Wet Bulb Globe Temperature) index among the Empirical indices, WBGT index is counted as preferable and reliable heat stress indicator in industrial areas.

We categorized the job positions based on work load in 4 classes, including: light, moderate, heavy and very heavy. Also WBGT index in defined working area is measured and the jobs positions which are exposed to heat stress are clarified. In order to assess the prevalence of cardiovascular abnormalities among workers who worked beside Electric Furnaces and Hot Mill workshops, we studied cardiovascular diseases in 580 workers, 100% men, including 40 foreman and 540 workers, initially healthy, full-time employees, aged 25-60, most with at least 5 years tenure with their employer. Furthermore the results are compared to control group working at the same work load without heat stress. We found a high prevalence rate of ischemic heart disease and conduction abnormalities among workers (21%) compared with the control group (5%). The lowest CVD values were observed for white-collar employees in hot mill workshops. The results showed that regular exercise reduces the risk of cardiovascular diseases. Interestingly, the prevalence of CVD in presence of combined harmful agents at work environment as: heat and noise increases considerably in comparison with single ones.

Conclusion: This study gives evidence of the fact that the subject's role (in its family, economic, social and psychological aspects) plays a crucial role in CVD. However, severe heat stress can result in deterioration in health including heat illness, with effects ranging from mild reversible cardiovascular disturbances. Although we can conclude that heat stress can contribute to the prevalence of cardiovascular disease, the evidence for a relation between heat stress and ischemic heart disease is still inconclusive because of the limitations in exposure characterization, researches, adjustment for important confounders, and the occurrence of publication bias.

Author(s): John M. Violanti

Title: Self-reported symptoms of post-traumatic stress and subclinical cardiovascular disease markers in police officers

Format: Paper

Posttraumatic Stress Disorder (PTSD) is a psychiatric disorder that can occur following the experience or witnessing of traumatic events such as combat, disasters, terrorist incidents, serious accidents, or violent personal assaults. Seventy percent of individuals will be exposed to a traumatic event during their lifetime. Eight percent of those exposed will develop PTSD while thirty percent will develop chronic PTSD. People who suffer from PTSD often experience nightmares and flashbacks about events, have difficulty sleeping, and feel detached or estranged. Symptoms can be acute as well as chronic and can significantly impair the person's life. Additionally, there is a growing body of evidence suggesting that individuals with PTSD exhibit a greater risk of physiological disorders, including cardiovascular disease. Police officers are generally exposed to multiple traumatic events in their work such as involvement in shootings, seeing dead bodies, dealing with abused children, and witnessing victims of serious accidents or disasters.

The present study examined the association between a self-reported subjective measure of PTSD symptomatology (Impact of Events Scale) and subclinical markers of cardiovascular disease (brachial artery reactivity and carotid intima medial thickness) in a stratified random sample of 100 Buffalo, New York police officers. The impact of events scale is a widely used, reliable measure of PTSD symptoms. The categories of those symptoms, in line with the DSM-IV, are avoidance and intrusion of memories of traumatic events. Brachial reactivity from baseline to maximum dilation and carotid IMT were measured by ultrasound.

Results indicated an approximate two-fold difference in brachial diameter increase ($p < 0.10$) between officers with subclinical (0.22mm) and those with severe (0.10mm) PTSD symptoms. No significant differences were noted in carotid IMT. While not statistically significant, these results suggest a possible association between psychosocial traumatic stress and a functional cardiovascular risk marker. A larger study of 700 officers is currently underway.

Session: W11

Abstract No: 013

Author(s): Hugo Westerlund

Title: Workplace Expansion and Hospitalisation for Cardiovascular Diseases

Format: Paper

Background: Downsizing has in previous studies, as well as in public debate, been associated with increased sickness absence, and a recent study also showed an increased risk of cardiovascular mortality (Vahtera et al, *BMJ*; 328(7439): 555. Only one study (Westerlund et al, *Lancet* 2004; 363: 1193–97) has, however, so far looked at the long-term relation between workplace expansion and morbidity. In addition to confirming the negative health effects of downsizing, this study showed increased sickness absence and hospital admission for people who had been exposed to repeated, rapid personnel expansion, especially among female employees in the public sector. In the present paper, we use the same methodology to investigate the specific relationship between personnel changes and cardiovascular morbidity.

Methods: We investigated exposure to personnel change during 1991–96 in relation to hospital admission for cardiovascular main diagnoses (ICD10: I00–I99) during 1997–99 in 24,036 participants with a complete employment record in the biennial national Swedish Work Environment Surveys from 1989 to the end of 1999. The analyses were performed with binary logistic regression, adjusting for age and social class.

Findings: Accumulated exposure to large expansion ($\geq 18\%$ per year) was related to an increased risk of hospital admission for cardiovascular diagnoses (1.39 [1.08–1.79], $p = 0.010$) among women in the private sector ($n = 4,766$). In this context, odds ratio signifies the change in odds for each additional year of exposure, varying from 0 to 6. This corresponds to an odds ratio of 7.31 [1.61–33.0] between full exposure (all 6 years) and no exposure.

Interpretation: This study shows that repeated exposure to rapid personnel expansion, possibly connected with centralisation of functions, statistically predicts hospital admission for cardiovascular diagnoses among women in the private sector in Sweden. Although no conclusions about causal pathways can be drawn from our results, this exposure should be considered in future studies, policy making, and occupational health care practice.

Session: F12

Abstract No: 014

Author(s): Xiao-Fei Zhang a, b MD, MS, Catherine D'ESTE a PhD, John Attia a MD, PhD, Xiao-Yan Ma c MD, MS, Zhi-Hong Liu b PhD

Title: The relationship between high blood pressure and coronary heart disease among Chinese And Caucasians a meta-analysis

Format: Paper

Background: Previous studies have suggested that the blood pressure is a particularly important risk factor for CHD in Orientals, and that the magnitude of the effect may be greater than in Caucasians, indicating that there may exist ethnic specific genetic or environmental differences in the mechanism or response to hypertension.

Objective: We performed a meta-analysis in order to define the magnitude of the risk of CHD associated with hypertension among Orientals; and to compare the magnitude of this risk with Caucasians.

Methods: We searched MEDLINE from 1966 to April of 2004 for Caucasian and Chinese studies (including previous meta-analyses), plus Chinese language databases from 1977 to 2003 for Chinese studies. Results were pooled using random effects model, and heterogeneity and publication bias were checked.

Results: Results indicate that the association of CHD risk with hypertension in Chinese is much stronger than in Caucasians. The pooled RR was 1.7 (1.5-1.9) for a 20 mmHg increase in SBP among Chinese versus 1.4 (1.3-1.4) for Caucasians: 1.3 (1.27-1.36) for Northern Americans, and 1.4 (1.3-1.5) for Europeans. The pooled OR for hypertension (defined as 160/95mmHg) was 5.2 (4.1-6.5) among Chinese versus 2.0 (1.7-2.3) among Caucasians.

Conclusion: The risk of CHD associated with hypertension is consistently and significantly greater in Orientals than Caucasians. This emphasises that public health interventions targeting hypertension control are critical in order to avoid the high morbidity and mortality of cardiovascular diseases.

Key words: coronary heart disease, hypertension, meta-analysis, blood pressure, Chinese, Caucasians

Session: T23

Abstract No: 017

Author(s): Dr Régis de Gaudemaris

Title: Quantification of psychosocial and organizational work factors (POWF): Special tools for healthcare workers epidemiology

Format: Paper

Objective: To develop instruments to make quantitative estimates of POWF in health care workers, as a complement to validated questionnaires (subjective assessment modalities).

Methods: characterization of POWF affecting care providers working with a pluri-diciplinar staff : psychologists, ergonomists, physicians. Review of the international literature addressing relationships between POWF, the health of care providers and the quality of care provision. Selection of a validated questionnaire and addition thereto of complementary items. Exploratory multifactorial analysis on a population of 561 care providers (including 322 nurses). Conception of two instruments to make objective measurements of POWF: on-site observation with a view to drawing up a grid to quantify organisational dysfunctions ; and external activity indicators supplied by the nursing management.

Results: three instruments are developed: the "expanded NWI-R" questionnaire including statistically independent supplementary items and two instruments for making objective measurements of POWF, both tested in situ (in a feasibility study). The factorial analysys confirms initials dimensions of WWI-R questionnaire and characterizes new independent factors: team work, organisational dysfunctions, support from administration, sharing same ethical rules, same sens of work values .

Discussion-perspectives: in the near future, multifactorial analysis of a second sample to confirm results, and analysis and external validation of the questionnaire with reference to external POWF measurement instruments. This work is to prepare for an epidemiological survey to estimate the impact of POWF on health in the hospital context, including direct impact on care providers (focusing on blood pressure and mental health) and indirect impact on patients (effect on quality of care provision). The current version of the protocol for the ORSOSA Study is presented

Session: W12

Abstract No: 020

Author(s): F. Leynen, E. Clays, G. De Backer, D. De Bacquer, M. Kornitzer

Title: Job Stress is related to smoking cessation

Format: Paper

Introduction: A good number of longitudinal studies have by now demonstrated a relationship between the perception of job stress and cardiovascular disease incidence. This relationship can partly be explained by classical risk factors. In the present study we have examined prospectively if stress at work is related to smoking cessation.

Methods: A total number of 2821 workers from 9 companies, who participated at the first Belstress project (1994-98), were included in a second survey after a mean time interval of 6.6 years. The response rate was 67%, two thirds of the subjects being male; the mean age at the second data collection was 50 years (SD 4.9). Job stress was investigated by Karasek's Job Content Questionnaire, and defined as either low decision latitude (DL), high psychological job demands (PJD) or the combination of both (job strain: JS). For the analyses on smoking cessation, only subjects reporting current cigarette smoking at baseline were considered.

Results: A sub sample of 603 men and 256 women were smokers at baseline, 21.1% of the males and 22.3% of the females had stopped smoking at the second survey. In crude analysis smoking cessation was inversely related to age and smoking intensity at baseline in both gender and to JS in males, and positively associated to socio-economic level and to DL in males.

In multivariate analysis male smokers, being in the lowest tertile of DL at baseline were 42% less likely (CI: 0.34-0.96) to have quit than their counterparts in the highest tertile, independently from age, occupational level and smoking intensity. For JS, a similar trend was observed with an OR of 0.62 (CI:0.36-1.08). In females a paradoxical inverse association between DL and quitting was observed; due to small numbers a fully adjusted multivariate model could not be applied.

Conclusions: Based on these prospective analyses we can suggest that men, perceiving low DL at their job are less likely to stop smoking, independently of their socio-economic level and the intensity of smoking. Especially in work-site preventive health initiatives, such as smoking cessation programs, this should be taken into consideration.

By improving the people's working conditions, a healthier lifestyle could more easily be adopted, which would not only result in an increase in the subject's well being but also in less sickness absence for the company and in economical benefit.

Session: F23

Abstract No: 021

Author(s): F. Leynen, E. Clays, G. De Backer, D. De Bacquer, M. Kornitzer

Title: 2: Diabetes mellitus is associated with an increased incidence of sick leave from work in middle aged men and women: the Belstress study

Format: Paper

Objective: A prospective study of the association between diabetes mellitus and sick leave from work

Methods: 21.149 men and women, aged 35-59 years, participate in the BELSTRESS survey, a prospective study on stress and health.

The prevalence of diabetes was obtained from questionnaire; sick leave was prospectively obtained from the Departments of human resources during the year following the baseline survey.

Outcome variables relate to the total duration of sick leave, to repetitive spells and to long absences of at least 7 consecutive days.

In multivariate analysis the relation between diabetes and sick leave was studied independent of age, body mass index, physical activity, alcohol intake, education, job title and smoking habits. Analyses were gender specific and included results from 15.740 men and 4.911 women.

Results: The prevalence rates of diabetes were 2.8 and 2.2% in men and women respectively. For each of the outcome variables a significant association between diabetes and sick leave was observed in univariate analyses both in men and in women. After controlling for all other co-variables a significant association was found between diabetes and total duration of sick leave (OR (CI): 1.51 (1.22-1.88)) as well as with repetitive spells (OR (CI): 1.54 (1.20-1.98)) in men. In women a similar trend was observed and a significant association was found between diabetes and repetitive spells (OR (CI): 1.71 (1.12-2.62)).

Conclusion: In this longitudinal study a significant association was observed between the presence of diabetes and sick leave from work. This relation was particularly strong for repetitive spells resulting in a longer total duration of sickness absence over a one year period.

Session: T12

Abstract No: 022

Author(s): Joel B. Bennett & Sue-Anne MacGregor

Title: Web-based occupational/cardiovascular health education for business managers and executive

Format: Paper

**This paper is being submitted as part of a symposia with Dr. Peter Schnall on educational programs for support knowing of workplace cardiovascular risks.

There is a strong and growing need to educate decision-makers about the costs of workplace risks (e.g., job strain, effort-reward imbalance) and the potential benefits of addressing such risks. Leader health behavior can present significant medical costs to an organization because of "trickle-down" effects: (1) leaders model healthy or unhealthy behavior to associates, (2) leadership style and decision-making can impact psycho-social risk and protective factors in the work environment, and (3) managers and executives make decisions about whether employees will receive health promotion programs. In short, wellness programs that elicit a positive change in heart healthy behavior affect both executives and their business.

This paper reports the preliminary results of a web-based or e-health program designed to train executives on workplace cardiovascular risks. The long-term objective of the project is to develop an electronically-based program that facilitates delivery of cardiovascular health promotion programs to workplaces. The short-term objective is to create an Internet program that trains managers and executives in personal and workplace health promotion.

To appeal to executives, the program couched health messages within a business-relevant leadership development program. Program content draws on the empirical relationship between healthy life-style and known behavioral risks in leaders (stress, social isolation, power motivation). Interactive exercises feature expert opinions and integrate leadership tips with tools for recognizing/addressing psycho-social risks for heart disease. A prototype web-site was developed and pilot-tested on a sample of 20 senior managers from various organizations. Executives and managers were interviewed, and provided Internet access along with evaluation instruments to assess potential usefulness of the program. Evaluation data provide the basis for Phase 2 development of a program designed to train leaders to self-assess risks, select health programs, and utilize strategies to disseminate similar programs for workers. The presentation will review web-site design, highlight several interactive tools, and report results from executive quantitative and qualitative assessment of the program.

Session: T12

Abstract No: 023

Author(s): Leslie Hammer and Robert Sinclair

Title: Graduate Training in Occupational Health Psychology Training Programs

Format: Paper

The Board on Health Sciences Policy of the Institute of Medicine (IOM, 2000) recently listed Occupational Health Psychology (OHP) as one of three fields with the potential to provide innovative strategies to address emerging health issues in the changing workplace. NIOSH offered a preliminary definition of OHP as a field involving the application of psychological principles to improving the quality of work-life and promoting the safety, health, and well being of people at work. OHP researchers and practitioners draw from the domains of public health, preventive medicine, nursing, industrial engineering, law, epidemiology, sociology, gerontology, and psychology to promote the safety, health, and well being of individuals at work. Professional interest in OHP can be traced back at least to the 1920s (cf., Quick, 1999; Sauter & Hurrell, 1999; Sauter, Hurrell, Fox, Tetrick, & Barling, 1999) and psychologists have recognized the need for a field that merges health issues with psychology since the early 1980s (cf., Schneider, Camara, Tetrick, & Stenberg, 1999), however, OHP remains an emerging discipline with tremendous, but relatively untapped potential to contribute to occupational health and safety. However, none of the NIOSH ERCs provide comprehensive training in OHP (Sauter et al., 1999) and only two of the current NIOSH TPG sites directly focus on OHP training. As one of these two TPGs specializing in OHP training, the Portland State University Occupational Health Psychology Program serves as a national leader in providing the innovating training called for by the IOM.

This presentation will outline the OHP training program at Portland State, describing some of the strengths and weaknesses of such a program. Graduate student recruitment will be reviewed, required and elective courses will be presented, a description of comprehensive exams will be presented, as well as examples of thesis and dissertation topics will be reviewed. In addition, outreach efforts with regional occupational health and safety groups will be discussed along with examples of practica, internships, and job placements that students have obtained in the area of OHP.

Session: F23

Abstract No: 024

Author(s): Peter Smith and John Frank

Title: Hours of work. Measurement issues, trends and related social and health outcomes.

Format: Paper

Much of the recent research into the health effects of new types of working arrangements has focused on changes in the number of hours worked per week by different segments of the labour force. In particular there have been large changes in the number, and type of hours worked by all members of a family (both partners and children). Further, while some segments of the labour force are working a greater number of hours per week, other segments are not finding enough working hours to meet their material needs.

This paper will describe long-term trends in working hours using numerous sources of Canadian population-level data for the years 1976 through to 2003. Results will focus on comparing trends in the usual number of hours worked per week and the actual number of hours worked per week, including paid and unpaid overtime, by Canadian labour force participants. We will also examine trends in how labour force participants perceive the number of hours they work (e.g. "fewer hours for less pay" versus "same hours for same pay"), and present possible health and social consequences associated with these changes in the number and distribution of work hours. Where possible results will be presented by different sociodemographic subgroups (e.g. gender, marital status, and education).

Session: T21

Abstract No: 026

Author(s): Marco Ferrario, Giovanni Veronesi, Giovanni Corrao, Carla Fornari, Roberto Segal, Rossana Borchini, Francesca Battaini and Giancarlo Cesana.

Title: Uneven differences in the risk of incident cardiovascular events among socio-occupational classes.

Format: Paper

Aims: To assess socio-occupational (SO) class differences in 11-year risk of incident coronary and stroke events in northern Italian cohort.

Methods: Four population-based cohorts (three MONICA Brianza surveys and the PAMELA study) recruited at baseline from 1986 to 1994 were follow-up until the end of 2002 to ascertain first coronary (CHD) and stroke events, fatal or non fatal (MONICA validated). At baseline major cardiovascular risk factors were investigated according to the standardised MONICA Project protocol. SO classes were based on current or last employment, according to Erikson, Golthorpe e Portocarero (EGP) classes: higher administrators and professionals (HAP); lower administrators and professionals (LAP); routine non-manual workers (NMW); skilled manual workers (SMW); unskilled manual workers (UMW); and self-employed (SE). Age-adjusted risk ratios (RR) and 95%CI were calculated from Poisson regression models.

Results: The MONICA and PAMELA cohorts recruited n. 2,959 35-74 year old employed or past-employed men free from CHD and stroke events at baseline. In 11-year median follow-up, the cohorts accumulated 33,926 person-years and generated 168 first major CHD events and 56 stroke events. The NMW class reported the lowest incident rates of both endpoints, and it was considered as the reference category. Higher relative risks of CHD events were found for LAP (RR=2.09; 95%CI 1.19-3.69), for UMW (1.81; 1.06-3.09) and for SE (1.87; 1.14-3.04). Higher relative risks of stroke were found for SMW (1.82; 1.04-3.19) and for UMW (2.38; 1.31-4.32). Considering the two endpoint combined, higher relative risks of CVD (CHD or stroke) were found for lower administrators and professionals; skilled and unskilled manual workers and self-employed. Multivariable adjustments for major coronary risk factors (total cholesterol, systolic blood pressure, cigarette smoking, HDL-cholesterol, diabetes) did not modify substantially the RRs. In addition, consistent results were obtained when SO classes were defined based on first-digit ISCO-88 codes.

Conclusion: The higher risks of major cardiovascular events among lower SO classes (skilled and unskilled manual workers), reported in other studies, is confirmed. In addition, higher relative risks among lower administrators and professionals, and self-employed were found in the present study. This helps to address preventive programs and health resources. Further researches on the same cohorts are needed to assess the etiologic role of job strain.

Session: T24

Abstract No: 028

Author(s): Alderling M, Theorell T, Bergman P, Stoetzer U, de la Torre B and Lundberg I

Title: Saliva cortisol - circadian variation in working men and women in relation to the demand/control model

Format: Paper

Background: Several studies of circadian variations in saliva cortisol concentration in relation to job conditions have been published. However, few of those have been performed on representative working populations. Cortisol regulation is an important possible link between exposure to job strain and elevated cardiovascular risk.

Sample and Methods: The PART study of mental health in the greater Stockholm population has been performed in two steps. First a screening step in which subjects with poor wellness score have been identified and second a detailed examination of all those with poor score and an equal-sized stratified random sample of subjects with normal score. In the present study these two groups have been analysed jointly. 348 women and 181 men filled out the short Swedish form of the demand/control questionnaire (DCQ) and satisfactorily collected saliva samples. Dichotomisation (median) was made separately for men and women respectively, and grouping of subjects into strain, active, passive and low strain job conditions was made. Saliva samples were collected at awakening, half an hour later, in the afternoon and at bedtime. Age (20-64) did not influence the associations. Two analytical procedures were used, namely analyses of associations in
 1.) all subjects regardless of type of circadian rhythm (all)
 2.) participants after exclusion of subjects (n=127) who had either consistently high concentration even at bedtime or consistently low concentration even in the morning. In this analysis only subjects who have a good biological response tendency are included (responders)

Results: In women a clear significant association between job condition and saliva cortisol concentration was found half an hour after awakening. Subjects in the low strain group had a lower concentration than subjects in the other three groups who were indistinguishable. A tendency in the same direction was found at awakening but no differences were found between the groups in the afternoon and at bedtime. The findings were similar in 1. and 2. In men a significantly greater rise in saliva cortisol between awakening and half an hour later was found between the high strain group and the other groups. This was seen only in 2. (responders). No differences were observed in alternative 1.

Conclusion: Significant relationships were found between cortisol regulation and demand/control

Session: W11

Abstract No: 029

Author(s): Johannes Siegrist

Title: Work, reward and health: the role of theory

Format: Paper

It may still take a long time until quality of work will have improved at a global level, given the threats and shocks of today's economic development. As quality of work has a substantial impact on productivity and well-being it is essential to identify its health-adverse 'toxic' components by means of theoretical models. One such model, effort-reward imbalance, is rooted in a basic principle of cooperative exchange, reciprocity, where efforts are compensated by adequate rewards (salary, esteem, status). Recurrent imbalance resulting from a mismatch between high efforts spent and low rewards received (e.g. due to unfair work contracts) elicit brain-mediated stress reactions that contribute to the development of a range of physical, mental and behavioural disorders.

Current evidence on associations of effort-reward imbalance at work with health, based on some 60 studies, highlights its explanatory power with respect to cardiovascular diseases, depression, type II-diabetes, and health adverse behaviours (e.g. obesity, alcohol dependence) among others. Although studies were conducted in different parts of the world and include a diversity of occupational groups, several challenges remain to be met.

In this presentation the following challenges are discussed: 1. Does the model need modifications in order to be successfully applied to different socio-cultural and economic contexts? 2. How can we advance explanations of the links between socio-economic status, poor quality of work (in terms of this model) and health? 3. What do we learn from comparative analyses that include complementary models of work stress? 4. Can the model be extended beyond paid work to include other types of socially productive activities? Progress in answering these questions is important in view of the policy implications of evidence-based theories of work-related stress.

Session: T21

Abstract No: 030

Author(s): Johannes Siegrist, Nico Dragano, Simone Weyers, Raimund Erbel for the Heinz Nixdorf Recall Study Group

Title: 2: Socio-economic status, work-related stress and cardiovascular risk: effect modification

Format: Paper

Psychosocial stress at work is often more prevalent in lower socio-economic status (SES) occupations and may, in part, mediate the reported associations of SES with cardiovascular disease. Even in the absence of a social gradient of work-related stress, SES is important as it may modify the effects of work stress on health (stronger effects among lower compared to higher SES groups).

We tested this hypothesis with data from the baseline survey of a study of some 1,755 healthy adults in Germany (58% men, 42% women aged 45 to 65) working full-time or part-time in different occupations. This study is part of a larger prospective cohort investigation on determinants of cardiovascular disease that includes 4,487 subjects aged 45 to 74 (the Heinz Nixdorf Recall Study Group). Work stress was measured by the effort-reward imbalance (ERI) model, and SES was assessed by three indicators: level of income, highest educational degree, and occupational standing.

Results based on logistic regression analysis reveal that the effects of ERI on cardiovascular risk are stronger in lower as compared to higher SES groups with respect to the following indicators: atherogenic lipids (low high-density lipoprotein cholesterol): odds ratio (OR [95% KI]) 1.80 [1.01-3.21] vs. 0.99 [0.40-2.45]; hypertension: OR 1.63 [0.93-2.85] vs. 0.63 [0.37-1.07]; effort-induced angina: OR 3.07 [1.67-5.63] vs. 2.67 [1.49-4.78], and depression: OR 2.55 [1.73-3.79] vs. 2.29 [1.33-3.98].

Findings are in line with the assumption of increased illness susceptibility among lower SES groups. They point to the need of directing preventive efforts primarily to these occupational risk groups.

Session: F23

Abstract No: 031

Author(s): A. Bortkiewicz, K. Rydzyński

Title: CARDIOVASCULAR DISEASES AS AN OCCUPATIONAL HEALTH PROBLEM IN POLAND

Format: Paper

Although the prevalence of cardiovascular diseases (CVD) exhibits a decreasing tendency, both in Poland and abroad, it is expected that CVD will continue to be a major health problem in the 21st cent. With regard to CVD, the most severe consequences are those associated with the coronary heart disease which accounts for 50% of all deaths in Poland, and arterial hypertension, which is ranked highest among the major causes of death worldwide. Conventional CVD risk factors, such as high cholesterol level, diabetes, arterial hypertension, obesity, physical inactivity, diet, genetic disposition and tobacco smoking explain only about 50% cases of CVD. Therefore, the effectiveness of the preventive activities that address only the conventional CVD risk factors is inadequate. Attempts have been made at identifying other factors that can contribute to CVD development. The results of research conducted thus far indicate that there may be as many as 200 different factors, including occupational and environmental agents, which can play a role in CVD pathomechanics. Unfortunately, the recognition of these factors among the physicians, occupational health and safety services and the workers themselves seems to be insufficient. In the Polish population, 60.7% of people are occupationally active. Consequently, CVD attributable to occupational work should be a subject of particular concern. The presently run Polish Register of Occupational Diseases does not include any records on CVD since these have been classified as work-related, not occupational, diseases. Such a classification is due, among other things, to the difficulties in assessing the risk associated with work-related factors. CVD have a complex aetiology and it would be most difficult to separate this risk from that due to other factors unrelated to work. The category of the work-related diseases has not as yet been considered in legal regulations. Moreover, no report regarding a qualitative or a quantitative assessment of such pathologies is available and no system for collection and processing of relevant data has been developed either. However, the problem needs to be resolved soon, particularly in view of the present economic conditions which are characterised by changing work environment and occupational hazards (increased pace of work, longer duration of working time, high time pressure causing stress, problems with the control of work performance, changes in work organisation – shiftwork system, increasing role of the static component in physical work). The changing conditions of work make the focus be shifted from 'classical' occupational diseases to work-related diseases induced by new occupational hazards for which relevant legal regulations

Session: T13

Abstract No: 034

Author(s): LGPM van Amelsvoort, NWH Jansen and IJ Kant

Title: Smoking among shift workers: more than a confounding factor

Format: Paper

So far, in studies on the cardiovascular disease risk among shift workers, smoking is considered to be a confounding factor. However, in a study among 239 shift and 157 daytime workers we found that shift work was prospectively related with an increased cigarette consumption (1) indicating that smoking might be in the causative pathway between shift work and cardiovascular diseases. However, the number of study subjects was too low to warrant sound conclusions. Therefore we used data from the Maastricht Cohort study to investigate the longitudinal relation between smoking and shift work in a much larger population. In this study, a total of 12,140 employees was followed for two years by means of self-administered questionnaires. We compared workers who worked during daytime hours only (74 %) with workers who worked in shifts (26%). Logistic regression analyses were performed to evaluate the two-years risk to start smoking (n=225) in non smoking workers, or the risk to quit smoking (n=318) in smoking workers, with adjustment for demographic factors (age, gender and educational level).

Table: Odds ratios for start smoking in non-smoking workers.

	Odds ratio(95 % confidence interval)	
Male (as compared to females)	0.60	(0.60 – 1.11)
Age (per year)	0.99	(0.98 – 1.01)
Shift work	1.42	(1.02 – 1.97)
Educational level		
low(reference)	1	
intermediate	1.00	(0.70 – 1.41)
high	0.70	(0.48 – 1.03)

Logistic regression analysis showed a significant association between shift work and start smoking during two years of follow-up (Odds ratio: 1.42, p: 0.03). The risk to stop smoking was only moderately, and not statistically significant, decreased in the shift workers (Odds ratio: 0.91, p: 0.5). To conclude, this study showed that, independently from educational level, shift workers are more prone to start smoking. This finding has important implications for both studies on the cardiovascular disease risk among shift workers, and for the reduction of the excess cardiovascular disease among these workers.

(1) Amelsvoort LGPM van, Schouten EG, Kok FJ: Impact of one year of shift work on cardiovascular disease risk factors. JOEM. 46(7):699-706.

Session: F22

Abstract No: 035

Author(s): Delphine SARAGOUSSI, Anne CHEVALIER

Title: What are the respective roles of social status, job characteristics and illness severity in the recovery after initial coronary event? First part: a study of sickness absence.

Format: Paper

It is now admitted that there are complex links between social status, work characteristics and ischaemic heart disease risk. But it is likely that such links also exist after the acute phase, and that socio-occupational status may influence coronary disease evolution as well as the course of the disease may modify socio-occupational characteristics. The crystallization of these complex relationships, concerning younger patients, is return and maintenance to work. There are few studies on this subject. The existence of an ischemic heart disease registry within a large nationwide power company (EDF-GDF) offers the possibility of exploring various sides of the problem, particularly sickness absence duration, return to work modes, and occupational evolution, as well as their determinants.

We considered 623 male employees (aged 31 to 62 years) appearing on the registry, who presented a non-fatal initial clinical form of coronary disease from 1993 through 1997. Medical variables such as diagnosis (angina pectoris [AP] or myocardial infarction [MI]), diagnostic and prognostic tests, and treatments were collected in the registry. Sick-leaves were systematically registered in an epidemiological database. We studied sickness absence duration due to the initial episode of coronary disease through linear regression on its logarithm. Social status was assessed by educational level at the time of hiring, work grade and INSEE socio-occupational category at the time of coronary event. Occupational status was described by job category, activity sector (production, transportation and distribution of electricity or gas, administrative services,...), exposition to physical strain, and sedentarity. Demographic characteristics were marital status, number of children, geographical area. Return to work data are currently being collected through questionnaires filled by occupational physicians.

Mean sickness absence duration was 80.5 days (SD=70.6), 51.29 days (SD=55.62) for AP, and 106.7 jours (SD=72.4) for MI. This duration independently increases in case of MI ($p<0.0001$), aorto-coronary bypass ($p<0.0001$), but also according to a descending social gradient expressed by educational level ($p=0.0008$) and work grade ($p=0.002$). A heavy physical strain also raises sickness absence duration, especially for MI ($p=0.049$). There was no effect of age. We found that 20% had half-time sickness absence, and that only 6 subjects retired after their coronary event.

Sickness absence duration depends mainly on disease severity, but also to a lesser extent on social status and on job characteristics. The next step will be the study of return to work modes and evolution of job and disease during the following 5 year period.

Session: T21

Abstract No: 036

Author(s): Anne CHEVALIER, Delphine SARAGOUSSI, Jonathan PENDEL

Title: Social status, occupational factors and risk of ischemic heart disease among French power company employees

Format: Paper

The link between social status and ischemic heart disease risk is now well documented. The role of working conditions, and particularly psychosocial factors at work, has been under investigation for the last two decades and seems more and more obvious. But the relationship between these two types of determinants still poses questions. The existence of an ischemic heart disease registry within a large nationwide power company (EDF-GDF) offers the possibility of investigating these links.

The cases considered were 675 men (aged from 31 to 62 years) appearing on the registry, who presented an initial clinical form of coronary disease from 1993 through 1997. We performed a cross-sectional study using the indirect standardization method with reference to the totality of the male workforce employed during the same period and computed Standardized Incidence Ratios (SIR) according to socio-demographic and occupational variables. Social status was assessed by educational level at the time of hiring, work grade and INSEE socio-occupational category at the time of coronary event. Occupational status was described by job category, activity sector (production, transportation and distribution of electricity or gas, research, administrative services,...), exposition to physical strain, sedentarity, and belonging or not to the organizational chart. Demographic characteristics were marital status, number of children, geographical area.

We observed a strong effect of educational level at the time of hiring (SIR=65%, CI 95%=[47-83] for technical education level; SIR=32%, CI 95%=[6-79] for high educational level). A similar gradient was observed for work grade and INSEE categories: the lowest SIR was observed for managers (SIR=69%; CI 95%=[57-82]); The SIRs were respectively equal to 111%(CI 95%=[100-123]) for supervisory personnel and to 128%(CI 95%=[110-148]) for operating employees. Among job characteristics, an over-incidence was observed only for the gas and electricity distribution sector (SIR=111%; CI 95%=[101-122]), particularly among unskilled workers (SIR=137%; CI 95%=[104-176]) and administrative employees (SIR=136%; CI 95%=[96-183]). On the contrary, some sectors are less at risk: directing organisms (SIR=61%; CI 95%=[37-90]) and mutual benefit insurance (SIR=40%; CI 95%=[21-67]). Lastly, the incidence of employees exposed to physical strain was particularly low (SIR=20%; CI 95%=[13-28]) due to a "healthy worker effect", as was that of "non active" employees (employees with no physical activity during work) (SIR=84%; CI 95%=[70-99]).

In spite of our data's lack of accuracy in describing job reality, our results suggest that social status has a predominant effect compared to work characteristics.

Session: P3

Abstract No: 038

Author(s): Arturo Juarez Garcia, PhD; Peter L. Schnall, MD

Title: Job Strain, personal control and other stressors in association with Blood Pressure, Cardiovascular Symptoms and Mental Health Outcomes in Mexican Nurses

Format: Paper

In Mexico, few studies have been carried out to test the relationship between psychosocial factors at work and health outcomes even though it has been demonstrated that stressful features of work organization are related to several diseases (e.g., hypertension, see Schnall, et.al. 2000). In particular, the Job Strain Model has wide appeal to the occupational health community worldwide for its parsimony and good empirical research results (Karasek & Theorell, 1991; Belkic, et.al, 2004). Nevertheless, the need to expand this model to include other psychosocial variables has been suggested widely (Kristenssen, 1995; Söderfeldt, 1996). Social support and Job insecurity seem to be as good predictors of health as job strain according to some studies in Mexico (Cedillo, 1999; Gutierrez, 2003). Also, the literature shows that personal variables such as self efficacy and emotional control have been associated with health outcomes (Grau, et.al, 2001; Schaubroeck, et.al; 2001); particularly when they are combined each other (McCabe, et. al., 2003). This combination, which incorporates a core of cognitive and emotional processes that are different among individuals, may differentiate their capability to adapt themselves to the environment demands. The concept has been called "Personal Control" (Juárez-García, 2004), since it refers to an internal-specific psychological characteristic among individuals and it is different from other kinds of control like Decision Latitude which refers to an environmental possibility to exert some control and is "external" to the individual. Although, some studies have failed to demonstrate that personal traits are related to Blood Pressure (e.g., Friedman, et. al.; 2001); we believe that it is necessary to consider more than just main effects and test with other health outcomes.

A cross-sectional study was carried out to test the association between Job strain, Personal control, Job insecurity and Social Support with Blood Pressure (BP), Cardiovascular symptoms and different Mental Health Outcomes (MHO) in Mexican Nurses (N=109). The results showed that: 1) Job strain was significantly associated with systolic and diastolic BP after controlling for traditional risk factors; 2) Job insecurity was associated with cardiovascular symptoms, 3) both Personal Control and Job insecurity were associated to MHO, and finally 3) an important interaction between Job strain and Personal control was found to be associated with all health outcomes levels. These findings suggest that the Job strain-BP relationship is valid in Mexican nurses and it seems that in addition to job strain, Job insecurity and Personal Control are very important psychosocial variables in Mexican workers.

Session: F22

Abstract No: 039

Author(s): Dasinger, Krause, Brand, Kaplan, Salonen

Title: Percent time at work in an upright posture associated with 11 year change in systolic blood pressure

Format: Paper

[Symposium: abstracts 39-43]

Recent epidemiological research has shown a strong association between prolonged standing at work and four year progression of carotid atherosclerosis. Increases in blood pressure (SBP), over time, could be one of the main pathways for the observed effects of an upright work posture on the development of atherosclerosis.

This study investigates the association of an upright work posture with 11 year change in SBP among 602 middle-aged Finnish men who participated in the prospective population-based Kuopio Ischemic Heart Disease Risk Factor Study and were gainfully employed at some point during the study's 11 year follow-up period. SBP was measured five times during a baseline examination and at four and 11 year follow-up exams. The average of the five values at baseline and at 11 year follow-up were used in the present analysis. Percent time spent in occupational physical activities requiring an upright body posture, i.e., standing, walking, and climbing stairs, was ascertained from an occupational physical activity interview administered at each assessment point. Averaged over the 11 year follow-up period, the percentage of time upright at work per year ranged from zero to 43%. The association of the average percentage of time upright at work per year and average yearly change in SBP between baseline and 11 years was studied in a multiple linear regression model controlling for 18 covariates, including technical, demographic, biomedical, psychosocial work, and behavioral factors, namely, leisure time physical activity, smoking, and alcohol consumption.

SBP increased an average of 0.35 mm Hg per year, or 3.85 mm Hg over the 11-year follow-up period, among men who spent zero time in an upright body posture at work and who were in reference categories and had average values on continuous covariates. Otherwise similar men, who were in an upright work posture 43% of the year, had a corresponding increase in SBP of 1.18 mm Hg per year, or 13 mm Hg over 11 years ($p = .009$). Age, income, and use of cholesterol-lowering medications were the only other factors found to have a significant positive association with change in SBP. The increases in age ($p < 0.001$) and income ($p=0.03$) needed to get the same effect found for men in an upright work posture 43% of the year are 20 years and 44,000 Finnish marks. Neither BMI nor time spent in conditioning leisure time physical activities had an effect on SBP change.

These results suggest that prolonged time in an upright posture at work constitutes a risk factor for the development of hypertension comparable to 20 years of aging, which in turn is one of the accepted major risk factors for the development of cardiovascular disease.

Session: F22

Abstract No: 040

Author(s): Krause, Dasinger, brand, kaplan, salonen

Title: Standing, walking and climbing stairs at work associated with 11 year progression of atherosclerosis

Format: Paper

[Symposium: abstracts 39-43]

Recent epidemiological research has shown a strong association between prolonged standing at work and hospitalization due to varicose veins, four year progression of carotid atherosclerosis, and all cause mortality.

This study investigates the progression of carotid atherosclerosis among 599 middle-aged Finnish men who participated in the prospective population-based Kuopio Ischemic Heart Disease Risk Factor Study and were gainfully employed at some point during the study's 11 year follow-up period. Ultrasound measurements of intima media thickness (IMT) of the common carotid artery were taken at baseline and at four and 11 year follow-up. Percent time spent in occupational physical activities requiring an upright body posture, i.e., standing, walking, and climbing stairs, was ascertained from an occupational physical activity interview administered at each assessment point. Averaged over the 11 year follow-up period, the percentage of time upright at work per year ranged from zero to 43%. The association of the percentage of time upright at work per year and average yearly change in $\ln(\text{maximum IMT})$ between baseline and 11 years was studied in a multiple linear regression model controlling for 23 covariates, including technical, demographic, biomedical, psychosocial work, and behavioral factors, namely, leisure time physical activity, smoking, and alcohol consumption. Log transformed Maximum IMT was used because it gave substantially better fitting models compared to models with untransformed change in max IMT. Analysis of \ln transformed change leads to estimates of relative change = $RC = \text{Final/Initial}$. Also $\% \text{change} = 100(RC - 1)$.

Maximum IMT increased an average of 2.4% per year among men who spent zero time in an upright body posture at work and who were in reference categories and had average values on continuous covariates. Otherwise similar men, who were in an upright work posture 43% of the year, had a corresponding increase of Maximum IMT of 3.3% per year ($p=0.025$). The increases in systolic blood pressure ($p<0.001$) and LDL ($p=0.001$) needed to get the same effect are 43.1 mmHg and 2.76 mmol/l, respectively. Also, the result for upright body posture was similar to the result for smokers who in contrast to the same reference group with 2.4% per year increased at 3.2% per year ($p<0.001$). Neither BMI nor leisure time physical activity had an effect on IMT change.

These results suggest that an upright posture at work constitutes a major risk factor for the development of atherosclerosis, comparable to the risk found for traditional risk factors such as smoking, high blood pressure, and high cholesterol.

Session: F22

Abstract No: 041

Author(s): Messing, Stock, Tissot, Laperriere, Couture

Title: Standing vs. walking can we distinguish them, and is the distinction important

Format: Paper

[Symposium: abstracts 39-43]

Working posture is thought to be an important determinant of musculoskeletal and cardiovascular health. Knowledge of the context and type of postures is necessary in order to examine their associations with health-related outcomes. Questions on the mobility of working postures were administered in 1998 to 9,425 Québec residents employed part or full time for at least 6 months. Results showed that 58% usually stand at work, and that standing is more common among men, workers under 25, those in the two lowest educational quintiles, and those with incomes under \$20,000 CAD. Only one person in six who works standing reports being able to sit at will. Women and men differ in the types of usual standing and sitting postures at work. Those who work standing and/or who work in more constrained postures are more likely to be exposed to other physical work demands such as handling heavy loads, repetitive work, forceful exertion and low job decision latitude.

The questionnaire on working postures, with some changes, was administered in 2002-2003 to 92 factory, laundry, hospital and blue collar public service workers. Subjects who had usually stood during their workday reported retrospectively on their mobility : usual movement within a 1-meter radius; within a 5-meter radius; over 5 meters. They were also asked whether they could sit down at will, occasionally or never. Observers recorded working posture continuously throughout the workday and also answered the same questions as the workers at the end of the workday. Using observer estimates as the "gold standard", validity was good for the question on mobility (Cohen's weighted kappa = 0.60, concordance 70.1%) and for the question on freedom to sit (Cohen's kappa = 0.72, concordance 85.9%). The response categories for both questions also corresponded to clearly different degrees of exposure to standing, walking and sitting, as measured by the recorded work activity.

It is possible that some inconsistent findings in the literature with regard to the physiological effects of standing would be rendered more comprehensible if information were gathered on mobility and freedom to sit. A variety of possible ways to describe mobility will be discussed.

Session: F22

Abstract No: 042

Author(s): Laperriere, Ngomo, Lejeune, Couture, Messing

Title: Standing, walking, blood pressure, and pain:are they linked?

Format: Paper

[Symposium: abstracts 39-43]

We therefore decided to examine the relationships between indicators of types of standing posture and 2 indicators of lower limb pain among 96 standing workers in factories and service occupations in Québec.

We characterized working posture in two ways: "computer recording (CR)" and "step counts (SC)". For CR, we recorded walking/standing/sitting over a full work day; for SC we recorded numbers of steps per sequence of steps for 5 min every half hour, over a full work day. A step was defined as one foot losing all contact with the floor and then being put down (scored visually). Initiation of walking was defined after each foot had left the floor once. Walking was finished when both feet were firmly on the floor. A sequence was defined as the steps taken from the initiation of the first step to the time when both feet were firmly on the floor. Time sitting was not considered during the step and sequence counts. Pain was ascertained in two ways: Pain reports (PR) were recorded by the worker on a diagram of the bottom of the foot at the beginning and end of the workday. We also recorded pressure-pain threshold (PPT) at points (3 replicates) on the plantar surface of the foot, at the beginning and end of the workday. A decrease in PPT over the workday corresponds to increasing pain sensitivity on the plantar surface of the foot. The decrease in PPT over the workday for the average of the points was used for some analyses. Systolic and diastolic blood pressure were recorded before and after work with a sphygmomanometer.

Men and women differed significantly in height, weight and body mass index (BMI), with men being taller, heavier, and weighing more for their height. Women had significantly lower PPT at the beginning and end of the day. Both sexes showed similar lowering of plantar PPT over the workday, but the relation between this decrease and working posture was complex and differed by sex. Both sexes reported more pain in the lower limbs after the workday. Systolic, diastolic and weighted mean $[D+1/3 (S-D)]$ blood pressure measured at chest level dropped over the workday, but the relation between this drop and working posture was complex. Hypotheses relating pain, PPT, circulation and working posture will be discussed.

Session: F22

Abstract No: 043

Author(s): Tuchsén, Krause, Hannerz, Burr, Kristensen

Title: standing at work and varicose veins

Format: Paper

[Symposium: abstracts 39-43]

Varicose veins of the lower extremities is one of the ten leading reasons for hospitalization in Denmark. In fact, the most common in-hospital vascular disorder among women is acute venous thrombosis of the minor and major deep veins of the leg. It is controversial if prolonged standing at work confer an excess risk for the occurrence of varicose veins.

A cohort of all 2.6 million gainfully employed 20-59 year old Danes in the year 1991 were followed up for 3 years on first hospitalizations due to varicose veins of the lower extremities. Exposure data came from a representative sample of the baseline population and were linked at a group level. Altogether 5 940 people were interviewed about occupational exposure and confounding factors.

For men working mostly in a standing position, the risk ratio for varicose veins was 1.85 (95% confidence interval (CI): 1.33 - 2.36) compared to all other men. The risk ratio for women was 2.63 (95% CI 2.25 - 3.02). The results were adjusted for age, social group, and smoking. Further analysis based on individual follow-up is in progress and the results will be presented.

Working in a standing position is associated with subsequent hospitalization due to varicose veins for both men and women.

Session: T12

Abstract No: 045

Author(s): Wayne Lewchuk, David Robertson, Donald Cole, Ted Haines, Mickey Kerr

Title: Unions, Labour Contracts and Health Outcomes

Format: Paper

This paper is based on ongoing work related to the CAW/McMaster Health in the Workplace Study. This study involved over 1,000 unionized automobile workers who were asked to complete a work organization and health survey. In addition, blood pressure readings were taken on the shop floor from the entire sample and approximately 20 percent wore an ambulatory blood pressure monitor for 24 hours. Using self-reported indicators and company data, the sample was divided into fifteen different job classifications. These include production workers, trades, office, and warehouse workers. A number of new work organization indices were developed with this sample in mind. Preliminary analysis has focused on defining the work organization characteristics of the different job classifications and constructing a health profile for each of the job classifications and for the sample as a whole.

Many of the job classifications in this study have limited control at work, high levels of monotony, and heavy workloads. In general those working on the vehicle and engine assembly lines face heavier workloads and less control than those in the trades and in the office classifications. Vehicle and engine assemblers were also 2 to 3 times more likely to report poorer self-reported health, pain at work, severe pain at work, and hypertension (measured as either point bp>140/90 or on hypertension medication) than skilled trades workers.

An important finding, which will be the focus of this paper, is that a number of the health indicators exhibited an "inverted u-shaped" age profile. On most indicators the prevalence of poorer health outcomes initially increased with age. For a number of indicators the prevalence began to fall after age 45. In others, the gap in health outcomes between our sample and the Canadian population as a whole narrowed after age 45. The worst health outcomes relative to the Canadian population was for middle age workers. One possible explanation for this outcome is the role of the union and the collective agreement at this workplace. All of the workplaces in this study were organized by the Canadian Automobile Workers. The agreements regulating these workplaces include a number of seniority based job rights including increased time off and improved access to preferred jobs. This paper will explore how workers use their seniority based job rights to buffer themselves from work related health risks and whether models of work organization and health should pay more attention to the role of unions and collective agreements at workplaces.

Session: F13

Abstract No: 046

Author(s): Hugh W. Davies, Weiwei Du, Paul A. Demers

Title: Occupational Exposure to Noise and Myocardial Infarction Morbidity

Format: Paper

Background: While a plausible model that links noise and cardiovascular disease exists and is supported by experimental evidence, epidemiological evidence has been inconsistent. Recent work by the authors showed a positive correlation between exposure to noise at work and acute myocardial infarction mortality.[1] Here, we report an extension of our original study that examined acute myocardial infarct morbidity (deaths and hospitalizations) in a population of sawmill workers who are highly exposed to noise at work.

Methods: The study population comprised 11,447 subjects who had worked at least 1 year in one or more of 14 BC sawmills between 1950 and 1995, and who were alive in 1985 (the first year that computerized hospital discharge records available in British Columbia). A quantitative retrospective exposure assessment was conducted using 1,900 personal dosimetry measurements. Cases were subjects who had died and whose death certificate cause of death was coded as ICD-9=410 or who had been hospitalized and whose discharge record had an ICD-9 diagnosis code of 410. Only first hospitalization was counted where subjects were hospitalized on multiple occasions. Internal exposure-response analyses were conducted using age and race-adjusted Poisson regression and using a low-noise exposed group as referents.

Results: There were 468 acute myocardial infarction events in the study group during follow up. In subjects employed in jobs with average exposure levels above 85 dB(A) we observed an increasing relative risk for acute myocardial infarction with increasing duration of exposure. Relative risk reached 1.6 with 20 to 30 years exposure, but this dropped to 1.2 in the highest exposure category (>30 years). A similar pattern of increasing risk with increasing duration was seen when exposure above 95 dB(A) was examined; here the maximum relative risk (1.3) was seen in the longest duration category. Results of the intermediate exposure level (90 dB(A)) were inconclusive. When exposure intensity was examined (by integrating noise level and time), we observed mostly flat exposure-response curves, though relative risks reached their maximum (1.6) in the highest exposure category (>115 dB*years).

Discussion: The results support findings of our earlier mortality study, though are less consistent among themselves. This may be due to the widespread use of hearing protection devices which would be expected to result in overestimation of subjects exposure to noise and a bias toward the null. Strategies for overcoming this limitation will be discussed.

[1] Davies, HW, K Teschke, S. Kennedy, MR Hodgson, P Demers, "Chronic exposure to occupational noise and acute myocardial death". *Epidemiology*, 2005, In Press.

Session: F21

Abstract No: 048

Author(s): Akizumi Tsutsumi, Kazunori Kayaba, Kumi Hirokawa, Shizukiyo Ishikawa

Title: Job strain and risk of stroke: a preliminary analysis among Japanese workers

Format: Paper

Background and study objective: Studies from Western industrialized societies have demonstrated that Karasek's demand-control model predicts cardiovascular diseases, in particular ischemic heart disease. Compared with ischemic heart disease in the Western societies, stroke is a heavier health burden of Japan. We aimed to explore the association between the psychosocial job characteristics and the risk of stroke from our ongoing prospective study.

Design: Prospective cohort study. Baseline examination in 1992-1995 determined socioeconomic, behavioral and biological risks, and psychosocial job characteristics. Job characteristics were measured using the MONICA version of Karasek's demand-control questionnaire ($\alpha = 0.69$ for demands and 0.65 for control, respectively). The participants were followed on average 8 years until March 2002 using systematic surveillance. Incidence cases were identified according to the Japan Ministry of Health and Welfare criteria. Cox proportional hazards regression analysis was used for multivariate analyses.

Setting: A multi-center community-based cohort of Japanese people.

Participants: 6929 workers (3333 men and 3596 women) with mean age of 51 who were economically active at baseline.

Main results: Among the participants who had been free from stroke at baseline, 97 incidence cases (61 men and 36 women) were identified during the follow-up. Workers exposed to job strain (concurrent high job demands and low job control) had the highest risk of stroke incidence. Compared with workers in low strain jobs (low job demands and high job control), the age and sex adjusted relative risk of stroke was hazard ratio = 1.4 (95% CI: 0.7-2.7). Adjustment for socioeconomic status, behavioral and biological risk factors reduced the risk slightly.

Conclusions: Workers exposed to job strain showed the highest relative hazard among the job characteristics categories. The statistically nonsignificant findings may be attributable to the small number of outcome events, possibly due to survivor bias or insufficient follow-up periods, and relatively low scale reliability. The inconclusive findings to date warrant further examination of the job strain hypothesis among Japanese workers.

Session: T14

Abstract No: 049

Author(s): Jiu-Chiuan Chen, Yi-Jen Chen, Wushou P. Chang, David C. Christiani

Title: Long driving time is associated with hematological markers of increased coronary risk among urban taxi drivers

Format: Paper

Objectives: Although previous epidemiologic studies have suggested that professional drivers are at a greater risk for coronary artery diseases (CAD), the underlying mechanisms remain unknown. This study examined the association between driving time and hematological markers of increased CAD in urban taxi drivers.

Methods: We conducted a cross-sectional analysis of the baseline data from the Taxi Drivers' Health Study cohort in Taipei City, Taiwan. We retrieved information on comorbidity, laboratory tests, age, and anthropometric measures from the medical records of 1,124 subjects (aged 44.6 ± 8.5 years). The whole blood cell (WBC) count was used as the primary hematological marker for increased CAD risk, whereas the platelets count and hematocrit (Hct) as the secondary markers. We implemented standardized questionnaires to collect information on demographics, health behaviors, work-related physical and psychosocial factors, and driving time profiles. Multiple regression was used to estimate the adjusted effects of driving time on three hematological markers.

Results: The measured hematological marker (mean \pm S.D.) was 6.66 ± 1.66 cells $\times 10^9/L$ for WBC, $47.2 \pm 3.5\%$ for Hct, and 243 ± 52 cells $\times 10^9/L$ for platelets. The average driving time per month was 269 ± 72 hours. For each 100-h of more driving per month, there was an associated significant increase in WBC count by 0.22 ± 0.07 cells $\times 10^9/L$ ($p=0.001$), in Hct by $0.6 \pm 0.1\%$ ($p<0.001$), and in platelets count by 5.1 ± 2.2 cells $\times 10^9/L$ ($p=0.02$). After adjusting for conventional CAD risk factors (aged, male, smokers, hypertension or high blood pressure, diabetes, and hypercholesterolemia), obesity, alcohol drinking, regular exercise, and sociodemographics (income, education, marital status, and employment status), long driving time was still associated with significant increases in WBC (increased by 0.16 ± 0.07 cells $\times 10^9/L$ per 100-h/month; $p=0.02$) and platelets counts (increased by 5.1 ± 2.3 cells $\times 10^9/L$ per 100-h/month; $p=0.03$). The effect on Hct was diminished in the adjusted analysis (increased by $0.2 \pm 0.1\%$ per 100-h/month; $p=0.10$). Additional controls for physical activities, self-perceived job stress, and job dissatisfaction did not alter the associations with increased WBC and platelets counts.

Conclusions: Longitudinal studies are needed to confirm the observed cross-sectional association and further examine the specific occupational exposures accountable for the association between driving time and hematological markers of systemic inflammation and hemostatic alteration.

Session: T14

Abstract No: 050

Author(s): Orawan Kaewboonchoo, Sumlee Saleekul, Toshio Kawai

Title: Blood lead level and blood pressure among bus drivers in Bangkok, Thailand

Format: Paper

The effects of chronic low level lead exposure include cognitive and behavioral deficits, high blood pressure and impaired renal function. This study was designed to examine relationship between blood lead level and blood pressure among bus drivers in ranging in age between 23 to 60 years with the mean age of 41.5 years (SD=7.8).

The subjects of this study were 444 male bus drivers (229 non-air and 215 air condition bus drivers) who were working for Bangkok Mass Transportation Authority. Blood pressure was measured in the resting lay down position. Blood lead concentration (Pb-B) was also measured.

The results reveal that 13.1 % of non-air and 8.4 % of air condition bus drivers had hypertension. Mean Pb-B of non-air bus drivers (6.5 microgram/dl, SD=2.2) was significantly higher than that of air bus drivers (6.0 microgram/dl, SD=2.2) ($p < .05$). The systolic and diastolic blood pressure significantly increased with increasing Pb-B. The logistic regression analysis revealed a significantly increased risk for developing hypertension associated with Pb-B after adjust for age, working years, smoking, alcohol consumption, BMI, and bus condition (Odds ratio, 1.14; 95% confidence interval, 1.02 to 1.28).

These results suggest that chronic exposure to low level lead affects to blood pressure. Therefore, monitoring of blood pressure for bus drivers who occupationally exposed to low lead level should be done to prevent and control hypertension.

Session: P3

Abstract No: 051

Author(s): Kobayashi F, Kawakami N, Haratani T, Ishizaki M, Hayashi T, Fujita O, Aizawa Y, Miyazaki S, Hiro H, Masumoto T, Hashimoto S, Hori R, Araki S. The Japan Work Stress and Health Cohort Study Group

Title: High job demands, and its combination with low supervisor support at work predict acute myocardial infarction in Japanese men: A prospective cohort study

Format: Paper

Objective: To clarify the effects of job stress on the risk of acute myocardial infarction (AMI) in Japanese working men by a large-scale prospective cohort study (the Japan Work Stress and Health Cohort Study) from multiple worksites in Japan.

Methods: Study sites were 6 companies/worksites in Japan, which include metal, automobile, electric, other manufacturing and electric power industries. At baseline, health check-up and a self-administered questionnaire survey including two sets of job stressor scales, the Job Content Questionnaire (JCQ), and the NIOSH Generic Job Stress Questionnaire (NIOSH-GJSQ) were conducted (average response rate, 85%). A total of 13,296 employed men were followed from 1997 to 2003. The subjects were dichotomized into two groups using median split, high and low job demands, job control, and social support in the two job stress scales, respectively. The subscales of job control (decision latitude, skill discretion), and of social support (supervisor support, coworker support) were also used for grouping. First, we put all the job factors into a Cox proportional hazard model simultaneously while controlling for age, study site, smoking, total cholesterol, triglyceride, blood pressure, BMI, HbA1c, family history of cardiovascular disease, and past history of angina. Then each combination of job factors was examined in the same way.

Results: During the follow-up periods, 25 AMI cases were registered by the occupational physician. In the analysis by using the NIOSH-GJSQ, the incidence of AMI was significantly greater among subjects in the High job demands group (RR, 3.21; 95% C.I., 1.25-8.26), and the High job demands-Low supervisor support group (RR, 2.43; 95% C.I., 1.08-5.46), compared with the other groups. The results by using the JCQ showed similar tendency, but did not reach significant level.

Conclusions: High job demands, and the High job demands-Low supervisor support status at work measured by the NIOSH-GJSQ predict the occurrence of AMI in the Japanese working men.

Session: W11

Abstract No: 053

Author(s): Emile Tompa, Heather Scott, Roman Dolinschi

Title: The Health Consequences of Precarious Employment Experiences

Format: Paper

Structural changes in industrialised economies have led to fundamental changes in labour markets, work systems, and employment relations. Firms have rapidly adapted to these changes by turning to “flexible staffing”, while labour-market legislative, economic and social mechanisms have failed to keep pace. These developments have exposed many labour-force participants to increasing levels of insecurity, a trend that may have significant consequences for the health and productivity of the labour force. We review how these macro-level economic developments and the concomitant rise in nonstandard and insecure employment arrangements may have put workers at-risk for a number of adverse health outcomes. As much of the empirical literature treats the pathways between insecure labour-market experiences and health as a “black box”, we attempt to elucidate these pathways using a comprehensive and explicit conceptual framework. This model of “work-related precarious experiences” highlights the key elements of work experiences that make them insecure or physically hazardous and elaborates the paths between these experiences and downstream health effects.

We will present results from our empirical investigation of these relationships using data from a Canadian longitudinal survey. This analysis investigates the impact of exposures to precarious employment experiences on several health-related outcomes including levels of general and functional health, and the probability of transitioning to worse health. We use a statistical procedure that can accommodate the unique nature of panel data, including the need to adjust for the correlation of multiple individual observations taken across time. We also outline several steps that we have taken in the analysis to control for the problem of reverse causality (i.e., where poor health precedes the exposure to negative employment experiences), lending credence to our findings. Our results show that a number of features of contemporary employment are experienced by workers as insecure or precarious, and that these experiences have adverse implications for the health of the North American workforce.

Session: W14

Abstract No: 054

Author(s): Reiner Rugulies, Ute Bültmann, Birgit Aust, Hermann Burr

Title: A Five-year Prospective Follow-up on the Impact of the Work Environment on Psychological Distress

Format: Paper

Background: It is widely assumed in occupational cardiovascular research that the work environment increase the risk of cardiovascular disease via heightened psychological distress. In this study, we investigated the impact of the work environment on psychological distress in a five-year prospective cohort of a representative sample of the Danish national workforce.

Methods: Data were analyzed for 3488 (47% women) employees who responded to both the 1995 and 2000 survey of the Danish Work Environment Cohort Study. Response rate was 80% in 1995 and 75% in 2000. Psychological distress was measured based on the Short-Form 36 Mental Health Scale. Psychosocial workplace factors were measured with scales on psychological demands, influence at work, social support and job insecurity. Multivariate linear regression analyses were conducted to assess prospective associations between the psychosocial workplace factors (both as categorical and continuous variables) and the extent of psychological distress. All analyses were adjusted for gender, age, cohabiting, children at home, education, smoking, alcohol consumption, leisure time physical activity, occupational status and psychological distress at baseline.

Results: Low influence at work, low social support and high job insecurity at baseline predicted high psychological distress at follow-up. The regression coefficients were 1.33 (95% CI: 0.31, 2.34, $p=0.011$) for low influence at work, 1.39 (95% CI: 0.48, 2.30, $p=0.003$) for low social support and 1.10 (95% CI: 0.05, 2.14, $p=0.040$) for job insecurity after adjustment for all covariates in the full model. Psychological demands were not associated with psychological distress. When we analyzed the psychosocial workplace factors as continuous variables, we found that with every 5-point increment on the scales on influence at work and social support, psychological distress decreased about 17% and 15% respectively. For every 5-point increment on the job insecurity scale, there was a 10% increase in psychological distress.

Conclusion: We conclude that exposure to adverse psychosocial workplace factors are significant contributors to psychosocial distress in the Danish national workforce. Psychological distress might be an important intermediate step in the causal pathway between work environment and cardiovascular disease.

Session: T12

Abstract No: 055

Author(s): Birgit Aust, Antje Ducki

Title: Comprehensive Health Promotion Interventions at the Workplace: Experiences With Health Circles in Germany

Format: Paper

To prevent work-related cardiovascular disease, comprehensive health promotion interventions at the workplace are needed. Health circles, the central element of a comprehensive health promotion approach that has been developed in Germany, emphasize organizational and psychosocial factors while actively involving employees in the process. The primary goal is to organize and change working conditions in such ways that harmful aspects are decreased while health-supportive aspects of the job are increased. Health circles are based on the assumption that employees are experts of their own job conditions and that this expertise should be used to improve the situation. Many studies have been conducted using the health circle concept, however not much is known about the overall findings and the scientific quality of these studies.

To fill in this gap a systematic evaluation of health circle studies was conducted. Through an extensive review 11 studies were identified, representing the results of 81 health circles. The scientific quality of the data is limited: Only 3 studies used (nonrandomized) control groups, whereas the remaining studies are based on retrospective before- and after comparison. Nonetheless, the available data suggest that health circles are an effective tool for the improvement of physical and psychosocial working conditions and have a favorable effect on workers' health, well-being, and sickness absence: Except for one study that focused mainly on coping strategies, all studies found improvements in working conditions. Stress was reduced because of better work organization, and physical strain was reduced by supplying better work equipment, technical, or ergonomic improvements. Five of the seven studies that evaluated sickness absenteeism rates found a reduction of absence. Although absenteeism is affected by multiple factors the findings indicate that the workplace changes developed by the health circle participants and implemented by the companies contributed to these improvements. While similar approaches of participatory work place interventions exist, health circles are unique, because they went beyond the status of feasibility studies and have been developed into a practical tool that is routinely used by a number of companies.

Clearly, more rigorous studies are needed to confirm the positive effects of health circles on employee's health, well-being and sickness absence. Fortunately, results from health circle studies with more reliable research designs will be available in the near future.

Session: F11

Abstract No: 057

Author(s): De Lange, AH; Taris, TW; Jansen, MAJ; Houtman, ILD; Bongers, PM

Title: Does the relation between work characteristics and activation-related health outcomes differ as a function of age?

Format: Paper

As in many other countries, the proportion of senior workers (aged from 45-65 years old) in the Dutch working population continues to increase (cf. Warr, 2000). Consequently, the senior worker has gained more research interest during the past decade than before. Following Warr (1996) and Ryff and Keyes (1996), in the present study worker health is conceptualized broadly, not only including health complaints but also encompassing positive, activation and motivation-related outcomes such as the motivation for learning new behaviors and active coping behavior. Earlier research has shown that older workers are relatively inactive learners and generally less motivated to take part in training (Warr, 2000). This is a problem as these workers do need to learn new behaviour in their complex work environment (Frese, 2000).

Earlier theorizing (Karasek & Theorell, 1990) has suggested that particular combinations of psychosocial work characteristics (i.e., high demands combined with high control) may elicit activation-related behavior. However, few studies have examined this activation-hypothesis (De Lange et al., 2003; Taris et al., 2003). The present study presents a longitudinal test of Karasek and Theorell's (1990) predictions as regards the effects of job demands and control on worker learning, and further examines whether the relations between these work characteristics on the one hand and active learning on the other differ for younger and older workers. We expect to find different results for the older versus younger workers (cf. Warr, 2000), but formulated no specific hypotheses as research on this particular topic is sparse.

DESIGN/METHODS: Our questions are tested using data from a 4-wave complete panel design (N =1159) of employees working in 34 different companies throughout the Netherlands. We will compare senior workers (≥ 45 ; N = 216) to young workers (< 45 ; N = 943). The data of this study is part of the longitudinal Study on Musculoskeletal disorders, Absenteeism, Stress and Health (SMASH). Data are analysed using structural equation modeling.

RESULTS: Our subgroup analyses revealed that the young workers reported significantly more activation-related outcomes compared to their senior workers. Moreover, these are predicted by different psychosocial work characteristics across time.

CONCLUSIONS: The results are discussed with respect to their impact for practical interventions that are targeted towards increasing worker active learning behavior and active coping behavior (as being a major dimension of worker health).

Session: F21

Abstract No: 060

Author(s): Liyang Xu, Shatin, N.T., Weihua Cao, Liming Lee, Brian Tomlinson, Medicine

Title: JOB CONTENTS, FAMILY STRAIN, PSYCHOSOMATIC SYMPTOMS AND BLOOD PRESSURE AMONG WORKING WOMEN IN BEIJING

Format: Paper

AIMS: Cardiovascular disease is becoming an increasingly important cause of morbidity and mortality worldwide. There is growing evidence that psychosocial factors play an important role in the aetiology of CVD. The objective of the study is: to test the psychometric properties of the 2 psychosocial stress models: 1) Job Strain Model (Karasek, 1979), 2) a self developed Family Strain Scale.

METHODS: This study is based on a cross-sectional self-administered questionnaire survey in a sample of 421 Chinese working women in Beijing: The information of job strain and family strain, social support, perceived stress, traumatic life events, health behaviors, BP, BMI and psychosomatic symptoms were collected. **RESULTS:** The standard measurement of JCQ and Family Strain Scale show acceptable psychometric properties and criterion validity in this population of Chinese working women. Job strain and family strain were each significantly associated with increased systolic blood pressure (4.8 mm Hg and 3.0 mm Hg respectively). Job strain was also significantly associated with increased diastolic blood pressure (3.1 mm Hg). Dual exposure to job strain and family stress was associated with a significant increase in both systolic (8.8 mm Hg) and diastolic blood pressure (4.1 mm Hg) in comparison with to unexposed women. Symptoms of suspected heart disease and recurrent sleeping problems were associated with majority subscales.

CONCLUSIONS: The findings indicate reasonable psychometric properties of the Chinese version of Job Content Questionnaire and Family Strain Scale. Job strain and family strain may have independent adverse effects on psychosomatic health and BP of Chinese working women.

Session: W14

Abstract No: 061

Author(s): Heather K. Spence Laschinger, PHD; Joan E. Finegan, PHD

Title: Job Strain as a Predictor of Nurse Burnout, Health, and Work Effectiveness

Format: Paper

Karasek (1979) argues that job strain occurs when a job has many psychological demands with little control. Job demands are the psychological stressors present in the work environment. Decision latitude or job control refers to employees' control over their tasks and conduct during the working day. This dimension has two main components: (a) skill discretion (the degree to which the job involves learning new things repetitiveness, creativity, varied tasks, and development of the individual's special abilities), and (b) decision authority (the individual's ability to make decisions about his/her own job, influence the work group, and influence company policy). High demands produce a state of arousal in a worker that would normally be reflected in such responses as elevated heart rate or adrenaline excretion. When workers have little perceived control, their arousal cannot be appropriately channeled into a coping response, resulting in an even greater and more prolonged physiological reaction (Karasek & Theorell, 1990). This results in fatigue, anxiety, depression, and physical illness (Karasek & Theorell, 1990). Karasek's Job Strain Model has been tested in a number of different populations and empirical support for the model is mixed. Most studies have found that job demands and/or job control predict cardiovascular risk factors, such as, psychological and physical strain.

A longitudinal predictive non-experimental design was used in a random sample of 192 Canadian staff nurses (matched cases return rate 58%). The sample was drawn from staff nurses at two points in time during the period of hospital restructuring in the province of Ontario (1998 and 2001). Nurses completed Karasek's Job Content Scale and Lyon's Job Tension Scale at Time 1, and the Maslach Burnout Inventory, measures of physical and mental health from Williams and Cooper's Pressure Management Indicator, and Shortell's Unit Effectiveness Scale at Time 2. A job strain score was created using the procedure used by Hlatky et al, 1995 resulting in a continuous measure of job strain expressed as the extent to which jobs are rated as a combination of low decision latitude and high psychological demands. Nurses' job strain and job tension at Time 1 predicted a significant proportion of reported levels of burnout at Time 2 ($R^2=.36$). These variables also predicted significant amounts of variance in both perceived unit effectiveness ($R^2=.35$), and quality of care ($R^2=.10$). Job strain was significantly related to nurses' physical health (lack of energy) ($r=.29$) and mental health (depressive symptoms) ($r=.18$). This study strengthens the results of previous cross-sectional research by Laschinger, Finegan, Shamian, and Wilk, 2001).

Session: F11 Abstract No: 063
 Author(s): Carla Fornari, Marco Ferrario, Roberto Segà, Giovanni Veronesi, Giovanni Corrao, Rossana Borchini and Giancarlo Cesana
 Title: Contrasting evidences on the association between job strain and coronary risk.
 Format: Paper

Background: Job Strain (JS) is under discussion because of possible positive relations with coronary risk, in particular blood pressure.

Aim: To further contribute to the verification of the hypothesis through the survey of a large sample of 25-54 year old employees of the Municipality of Milan, 1638 men and 2906 women, enrolled from 1992 to 1996 in the JACE project (Job stress, Absentism and Coronary Events), a multicentric european study.

Methods: Job strain was investigated through a questionnaire derived from the Karasek model. Systolic and diastolic blood pressure (SBP, DBP), total and HDL cholesterol (TC, HDLC), body mass index (BMI) were investigated through standardized procedures. Moreover social and behavioural factors such as education, alcohol and coffee intake, smoking habits, leisure time and working physical activity were collected through another standardized questionnaire. Partial Pearson correlation coefficients were calculated among JS, risk and behaviour factors. ANOVA and ANCOVA were used to compare risk factors means.

Results: Passive followed by high strain groups resulted the more prevalent JS categories, both in men (29.91% and 29.32%) and in women (27.29% and 29.28%). Modest negative correlations were detected between JS and blood pressure both in men (SBP, $r = -0.085$; DBP, $r = -0.061$) and in women (SBP, $r = -0.046$; DBP, $r = -0.079$). These results were coherent with the negative relation observed between JS and BMI which was positively associated with BP in men; while in women, with the positive relations detected between JS and smoke, JS and coffee intake which were negatively associated with BP. Only in women JS resulted negatively associated with HDL ($r = -0.048$). This agreed with the relations observed between JS and leisure time physical activity, coffee intake, smoke and BMI on one hand and HDL on the other. SBP differences remained significant even adjusting for behaviour factors; DBP differences keep significant only in women. In women, JS was still associated with HDL after adjusting for behaviour factors: passive and high strain groups showed the lowest values.

Conclusions: The relationship between JS and BP is an unfinished business: sample characteristics and measurement methods should be carefully considered. HDL decrease with strain in women is a novel finding which deserve future research.

Session: W13 Abstract No: 064
 Author(s): Ta-Chen Su,1,2 Yuan-Teh Lee,1Suzzana Chou,2 Wen-Tsan Hwang,2 Jung-Der Wang1,2
 Title: Twenty-four-hour Ambulatory Blood Pressure and Duration of Hypertension as Major Determinants for Intima-Media Thickness and Atherosclerosis of Carotid Arteries
 Format: Paper

Background and Purpose: The relationship between time factors of elevated blood pressure (BP) and carotid atherosclerosis (CA) are still unclear.

Methods: The associations between time-weighted average 24-hour ambulatory systolic BP (TWA-SBP), duration of hypertension, and CA were investigated in a petrochemical company sample of 95 executives and 91 gender- and age-matched non-executives employees. Maximal intima-media thickness (IMT) and plaque scores of extracranial carotid artery (ECCA) were determined bilaterally by high-resolution B-mode ultrasound. The determinants of segment-specific carotid IMT and odds ratios for CA, in terms of thicker IMT (IMT ≥ 75 th percentile) and ECCA plaque score ≥ 3 , were evaluated by multivariate regression analysis.

Results: Mixed models revealed TWA-SBP and duration of hypertension were two major determinants of IMT at common carotid artery (CCA) and carotid bulb. Meanwhile, the executives were found to be a negative association with IMT at carotid bulb. Measurements at both internal carotid artery and bulb identified duration of diabetes mellitus as significant determinants of IMT. After controlling covariates, multivariate logistic regression analysis also found TWA-SBP and durations of hypertension and DM as the important determinants for CA.

Conclusions: Both TWA-SBP and duration of hypertension were independent risk factors for CA, which imply that both long-term and short-term duration of elevated BP are important in the pathogenesis of CA.

Session: T13 Abstract No: 065
 Author(s): Ta-Chen Su,1,2 Lian-Yu, Lin, 1 Wen-Tsan Hwang,2 Yuan-Teh Lee,1 Chen-Fong Chen,2 Jung-Der Wang1,2
 Title: Elevated Blood Pressure, Decreased Heart Rate Variability and Delayed Recovery after Working on 12-hour Night Shift
 Format: Paper

Background: Shift work has been associated with increased risk for cardiovascular disease. However, the potential effects of 12-hour (12-h) shift on cardiovascular system are still unclear. The objectives of this study are to determine the dynamic blood pressure and heart rate variability (HRV) changes following 12-h shift.

Methods: We recruited 15 male shift workers from a semiconductor factory with a mean age of 32.9 years. Ambulatory BP monitoring was performed for a total of 48 hours for each participant, namely, shift work for 12-h and resting for 36-h. Among them, 7 subjects completed a total of 96 hours' monitoring, including a 48-h for night shift period (8PM-8AM) and another 48-h for day shift period (8AM-8PM). A 24-h Holter ECG monitoring was also performed in 6 workers each in day shift or night shift when they were simultaneously receiving Ambulatory BP measurements. For the equal comparison and considering the diurnal changes of hemodynamic parameters, paired t-test was used to estimate the significant difference between two measurements, namely the shift work time and the corresponding resting time at the same timetable intra-individually. Mixed models also were constructed for estimate the effects of night shift on delay recovery of BP.

Results: Compared with the effects of 12-h day shift work on the corresponding resting daytime, the 12-h night shift work was found to have a persistent elevation of BP and HR and a decrease in heart rate variability at the corresponding resting nighttime. The delay recovery of SBP and DBP also was found after adjustment for possible confounding factors, age, smoking, BMI, shift work type and working status by mixed models.

Conclusions: Twelve-hour night shift work may elevate BP and HR and decrease HRV, and associate with delay recovery in SBP and DBP.

Session: T14 Abstract No: 066
 Author(s): Tüchsen F, Hannerz H, Roepstorff C, Krause N.
 Title: Stroke among male professional drivers in Denmark: 1994-2001
 Format: Paper

It is well documented that bus drivers and other professional drivers are at high risk of hypertension and ischemic heart disease. However, only two studies have dealt with cerebrovascular diseases among drivers showing that professional driving is associated with an increased risk of stroke morbidity. The aims of this 8-year prospective cohort study were, first, to estimate the relative risk of stroke among various groups of professional drivers, and second, to determine if any excess risk should be attributed to infarction or hemorrhage.

A cohort of 6285 bus drivers, 4204 car, taxi and van drivers, and 25879 heavy truck and lorry drivers were followed up for hospitalization due to stroke and subdiagnosis in the period 1994-2001. We used hospitalization among all economically active men as standard in the calculations of standardized hospitalization ratios (SHR) taking age, social status, and county into consideration. We used a loglinear poisson regression model to estimate the SHR's.

We found a high SHR for stroke among all groups of professional drivers: among bus and tram drivers SHR was 145 (95% confidence interval (CI) 121-174); among car, taxi and van drivers the SHR was 155 (95 % CI: 123-192), and among heavy truck and lorry drivers the SHR was 121 (95% CI: 108-135). The excess risk for all groups was significantly higher for cerebrovascular infarction than for non-traumatic intracranial hemorrhage: the relative risk ratio was 1.36 (95% CI:107-174).

All groups of professional drivers are at increased risk of stroke. The excess stems from cerebral infarctions rather than non-traumatic intracranial hemorrhage, suggesting that the high rate of stroke is caused by atherosclerotic changes, which in turn have been shown to be caused by hypertension and mental stress at work in the Kuopio Ischemic Heart Disease Risk Factor Study.

Session: T13

Abstract No: 067

Author(s): Finn Tüchsen, Harald Hannerz, Christian Roepstorff, Hermann Burr

Title: A 12-year prospective study of circulatory diseases among Danish shift workers

Format: Paper

Fifteen previous studies of the risk of heart disease after shift work reached very different estimates and review authors disagree about the validity of some of the studies. Two large Danish studies reached very different conclusions. Furthermore did a recent cross sectional study show that shift workers had a higher prevalence of nearly every unfavorable work environment factor investigated. Exceptions were dust exposure and quantitative demands. Especially conflicts at work and low decision latitude were more frequent among all the groups of shift workers. All-day walking or standing work and part-time jobs were more often found among female shift workers. The aim of the present study is to estimate the risk of heart disease in a prospective follow-up of a representative sample of gainfully employed Danes taking known confounders into consideration.

A cohort of 5,455 people who were gainfully employed in 1990 were followed up for all hospital discharges due to circulatory diseases (international classification of diseases version 8= 400-458 and version 10 = I00-I99). A loglinear Poisson model was applied to control confounding factors and calculate standardized incidence ratios were calculated for men and women working nights, evenings or other non-day shifts compared to day-workers.

Comparing all non-day workers with all day-workers we found a standardized hospitalization ratio (SHR) for all circulatory diseases of 1.36 (ninety five percent confidence interval (CI): 1.10-1.68). Control for 14 confounders reduced this estimate slightly to SHR = 1.31 (95% CI: 1.06-1.63).

This study confirm that shift work carry an excess risk of circulatory diseases. Despite a high prevalence of other exposures known or suspected to cause circulatory diseases the risk remain high after control for such risk factors.

Session: F13

Abstract No: 068

Author(s): Sumlee Saleekul, Arpaporn Pauwattana, Orawan Kaewboonchoo

Title: Hypertension among bus drivers in an urban area, Thailand

Format: Paper

Bus drivers as a group have elevated health risks that are related to their working conditions. This study was designed to examine the prevalence of hypertension among bus drivers working for Bangkok Mass Transit Authority and its related factors. The subjects of this study consisted of 435 male bus drivers and 278 male age match others workers from rural area area (control). Their age ranged from 20-59 years. Blood pressure of two groups was measured in the resting supine position with digital automate sphygmomanometer. Body weight and body height were also measured. The subjects were interviewed their lifestyle by trained research assistants. The results reveal that the bus drivers (23.2%) had significantly higher prevalence than those of the control (13.6%). The mean systolic and diastolic blood pressure of the bus drivers were also significantly higher than those of the control. The logistic regression analysis revealed a significantly increased risk for developing hypertension associated with age, BMI, smoking, exercise and blood lead level for the bus drivers and those associated with age and BMI for the control. These results suggest that risks factor of hypertension of the bus drivers not only physical factors but also behavioral and occupational factors. Therefore, monitoring of lifestyle and working environment together with blood pressure for the bus drivers should be done to prevent and control hypertension.

Session: P3 Abstract No: 069
 Author(s): Yawen Cheng, Ke-Jong Chen, Chi-Jane Wang, Shih-Hung Chan, Wei-Ching Chang, Jyh-Hong Chen
 Title: Secular trends in coronary heart disease mortality, hospitalization rates, and major cardiovascular risk factors in Taiwan, 1971-2001
 Format: Paper

Background: While mortality from coronary heart disease (CHD) has declined substantially in most developed countries in recent decades, discordant rising trends have been observed in many developing and newly developed countries. In this study we examined the trends of CHD mortality and its hospitalization rate, and correlated the trends with changes in major cardiovascular risk factors in Taiwan.

Methods: Mortality data during the period from 1971 to 2001 were obtained from official vital statistics. Hospitalization rates were calculated using information extracted from the National Health Insurance Database, which was available from 1996 to 2001. Changes in major cardiovascular risk factors were obtained from official statistics and by reviewing previous epidemiologic studies.

Results: In 2001, the age-standardized CHD mortality in Taiwan was 28.7 per 100 000 for men and 15.5 per 100 000 for women. For both men and women, age-adjusted CHD mortality increased slowly but steadily from 1971 to 1992, but after then a downward trend was observed. Hospitalization rates for CHD, however, increased substantially from 1996 to 2001. Levels of per capita cigarette consumption, dietary fat intake, body mass index, and prevalence of hypertension and diabetes had all increased over the past three decades.

Conclusions: The overall cardiovascular risk profile has worsened in the general population in Taiwan. The declines in CHD mortality observed in recent years were most likely attributable to the improvement in acute cardiac care and medical treatment among patients with CHD. We anticipated that CHD incidence and prevalence would continue to rise in Taiwan.

Session: F21 Abstract No: 070
 Author(s): Yawen Cheng*, Shane-Haw Wang, Chi-Jane Wang, Shih-Hung Chan, Jyh-Hong Chen
 Title: Working hours, psychosocial job characteristics, and the incidence of acute myocardial infarction among middle-aged men in Taiwan
 Format: Paper

Objectives: To investigate the extent to which working hours and adverse psychosocial job characteristics affect the incidence of acute myocardial infarction.

Design: Case-control study.

Setting: Tainan city and county, Taiwan.

Subjects: Study subjects were 200 men, aged 30 to 65 years, who admitted to two major medical centers in Tainan area with acute myocardial infarction (AMI) during the period from August 2001 to May 2003, and an equal number of age-, sex-, and residence-matched community controls.

Main outcome measures: Odds ratios for AMI in relation to working hours, job control and job demands as assessed by Karasek's demand-control model, and a specific work attitude characterized as "over commitment".

Results: Longer working hours and higher job demands were both associated with an increased risk of AMI, but no particular associations were found with the level of job control. Being over committed to work was associated with a significantly increased risk, and employers of small-sized enterprises are found to be at higher risk as compared to salary employees and self-employed workers.

Conclusion: Excessive overtime work, being over committed to work, and being employers of small-sized enterprises are important risk factors for acute myocardial infarction among middle-aged men in Taiwan. Our results, however, did not support the hypothesis that low control at work was an independent risk factor for AMI, as consistently found in western countries.

Session: F21

Abstract No: 071

Author(s): Jorge Román Hernández

Title: THE HIDDEN SIDE OF SUBJECTIVITY: MOTIVATIONAL COMPONENT IN Denad-control model as a risk of hypertension

Format: Paper

BACKGROUND: Karasek's Demand-Control Model has been successfully used to describe the psychosocial risk of cardiovascular diseases. Its instrument, the Karasek's Job Content Questionnaire (JCQ), emphasizes the way in that a person perceives his job demands or possibilities to exert control over his work conditions (presence or absence), but it remains unexplored the way in that a person needs or prefers a certain level of demands and allowed control. In other words, in this Model the cognitive component of subjectivity prevails over the motivational one.

OBJECTIVE: This research was aimed to test the role of individual needs and preferences concerning these characteristics of the job: demands and control as a risk of high blood pressure (HBP).

DESIGN: Case control study.

METHOD: 534 participants (111 scientific researchers, 154 workers from a beer factory workers, 91 workers from a factory of electronic devices and 178 workers of an agro-industrial complex) filled out a 14 items Spanish version of the JCQ, and another parallel questionnaire exploring the participants needs and preferences concerning job demands and control. The prevalence of HBP was determined by means of two measures: casual blood pressure (BP) at their workplace medical cabinets and by the average point estimates of BP at their specific worksites.

RESULTS: 1) The low control itself behaved as a risk for HBP, as it has been reported in the literature; 2) the low need of job control was a significant risk factor for HBP, 3) particularly for those who perceived their work as of high control.

Session: F12

Abstract No: 072

Author(s): M. C. Mireya Scarone A. & Dra. Leonor A. Cedillo B

Title: Thank you for calling Telmex, May I help you Service Interactions and Psychosocial Risk Factors among Telephone Women Workers in Mexico

Format: Paper

In sales by phone, employees have service interaction with the costumers, some times employees confronted with costumers' aggressive behavior caused by failures in the service. This type of interaction between the telephone worker and the costumer is a particular risk factor for health causing stress in the workers. Public services often demand workers to be in control of their emotions. This control of workers' own emotions for changing to those emotions that are convenient to the company target, have been named "Emotional Work" (Doucet, 1998; Hochschild, 2003).

This study examines the psychosocial risk factor to health present in the interaction between customer and employees in two groups of women workers. These workers attend costumer service by telephone in the state of Sonora, in Northern Mexico. One group are telephone operators assisting clients in long distance calls, and directory assistance. A second group women who sales services and products by telephone to individual customers or organizations.

This study evaluates the interaction between the telephone workers and the costumer as a psychosocial risk factor to worker's health. It was conducted in a telephone company through two steps: Firstable, we conducted individual interviews, to know the employees perception about their work environment and their interaction with the costumer and Second, we developed and applied a questionnaire to 124 workers of the two working areas mentioned above. Including such items regarding the interaction with the client, the ones of the Job Content Questionnaire and the ones needed for the psychological strain scales. There were constructed three new job stressors scales: 1. "Violence in the Service", which evaluates the insults from aggressive clients and anonymous persons who call to insult with sexual proposes. 2. "Personal Accomplishment", evaluates well being or personal satisfaction as a results of the workers interaction with the client. 3. "Emotional Demands" evaluate works demands. A factor analysis with Varimax rotation and discriminate validity (ANOVA test) were conducted to obtain several of the job design that were exanimate.

The statistical information confirms that more than 80% of the studied population experience some component of verbal aggression. About 30 and 40 % of the calls every day are verbal aggressions of sexual type in the long distance service. A minor percentage corresponds to costumers who insult Workers.

We found that the telephone workers use efficient mechanisms to copying these adverse stressors which have benefic effects in workers health. These mechanisms of response are supported and approved by the union.

Session: T24

Abstract No: 073

Author(s): Hansen, Å.M., Garde, A.H., Persson, R., Karlson, B.

Title: Long working hours and salivary cortisol

Format: Poster

In Denmark construction workers have a higher risk for a number of diseases (e.g. cardiovascular diseases). It is common for construction workers to live in camps and work 12-hour shift due to long transportation to the work place. In a review 12-hours shifts have been found to have both advantages (lower stress levels, better physical and psychological well-being, improved durations and quality of off duty sleep and improvements in family relations) and disadvantages (increased fatigue and less safety) compared to 8-hours shifts. Also, long workdays because of overwork have been associated with health problems, although the current evidence is found to be inconclusive. Some of the reported disadvantages are increased fatigue, less safety and negative social consequences, particularly when compared to ordinary 8-hour daytime shifts. Even if long workdays and overtime work have been linked with health problems, the current evidence is inconclusive or even missing. For example, work scheduling encompassing long working hours in combination with extended workweeks have received only minor attention. Moreover, few studies have used endocrine markers to assess stress and strain. This is unfortunate because one of the suggested mechanisms behind poor health is alterations in the activity of the hypothalamus pituitary adrenal axis (HPA).

The aim of the present work was to evaluate the effects of 12-hour workdays and extended workweeks by use of endocrine response variables. The main hypothesis was that long workdays combined with extended workweeks would lead to an increased HPA activity as reflected in increasing concentrations of cortisol in saliva. Two groups of male constructions workers (n=30) and one group of male white collar workers (n=180) were studied. 14 of the construction workers worked cycles of aprox. 12 hours a day 6 days in a row; 1 day off work; 5 days in work; and 9 days off work. The rest of the construction workers worked 8 hours a day but had long daily transportation time (avg. 80 minutes). 7 construction workers had more than 2 hours daily transportation. The participants were between 19-65 years of age, and had BMI's from 16.2 to 33.6 kg/m².

Construction workers, in general, had higher concentrations of cortisol in saliva during a working day compared with white collar workers working the regular 7.5 hours a day. The observed difference in salivary cortisol could not be explained by differences between groups in BMI and age. The result suggests that construction work is associated with increased HPA activation and

implies that the total work time, including transport times, is of importance for the stress response.

Author(s): Grebner, S., Elfering, A., & Semmer, N. K.

Title: Risk is other people? Impaired blood-pressure recovery as a consequence of social stressors at work

Format: Paper

There is good agreement that task-related stressors (e.g., time pressure, and role conflict) are important predictors of job strain. However, research has paid less attention to effects of social stressors at work such as the impact of conflicts with supervisors, and colleagues on blood pressure recovery. The effects of task-related and social stressors on blood pressure recovery were analysed in two studies.

The first study is an in-depth study of the longitudinal research project 'Work Experiences and Quality of Life in Switzerland' (AEQUAS). Thirty-three healthy female job beginners served as participants in a longitudinal study with 2 waves and a time lag of 1 year. Task-related stressors, and job control were assessed using self-reports as well as observation ratings by trained observers. Social stressors were assessed by self-report. Blood pressure recovery was operationalized as the difference between the level measured in the evening of a work day and the level measured on a subsequent rest day. Hierarchical regression analyses showed that social stressors at Time 1 predicted impaired systolic blood pressure recovery in the evening of a day off in Time 2 over and above task-related stressors at Time 1, controlling for job control, age, body mass index, consumption of nicotine, alcohol, and caffeine ($p < .05$).

In the second study 32 middle-aged healthy male instructors were investigated with a repeated measurement design with 3 waves, and a time lag of 6 weeks. Observation ratings by trained observers were used to measure task-related stressors and job control. Multilevel-regression-analyses showed that social stressors predicted impaired systolic blood pressure recovery in the evening of days off from previous work-day levels, controlling for task-related stressors, job control, age, body mass index, consumption of nicotine, alcohol, and caffeine, number of critical life events, and number of stressful events encountered at work and at home ($p < .05$).

Results of both studies demonstrate, that social stressors at work can hamper cardiovascular recovery from work demands. In the long term impaired blood pressure recovery may contribute to development of hypertension. Therefore, results suggest not only to incorporate measures of social stressors routinely into stress-oriented job analyses, but also to include measures tailored to social stressors into stress prevention and intervention (e.g., training of interpersonal competences such as conflict management).

Session: W13

Abstract No: 078

Author(s): Sean Collins, ScD; Robert Karasek, PhD

Title: Evidence of Reduced Vagal Cardiac Control Variability in Exhausted Subjects and High Strain Job Subjects

Format: Paper

This paper presents reduced vagal cardiac control variability in exhausted subjects and high strain job subjects. This evidence is based on the Stress Disequilibrium Theory of Karasek and a biological reinterpretation including an altered phenotype based on long term stress exposure and adjustments in phenotype plasticity as an underlying cause of reduced vagal variability. A method for testing the proposed hypotheses using data obtained through ambulatory electrocardiograph monitoring is introduced. The theory links stress and exhaustion with reductions in adaptive capacity of physiological systems measured as system level reductions in variance.

We measured Job Strain using the Job Content Questionnaire, 8/day diary reports, and a nationally standardized occupational code linkage in 36 healthy mid-aged males with varying strain jobs. The subjects were Holter-monitored for 48 hours, including a work and rest day. Subjects responded to questions on a daily diary as well as on the Job Content Questionnaire to test for exhaustion as a dichotomous state variable. Vagal cardiac regulation was measured by components of electrocardiograph output: the heart rate variability based measures of high frequency power (HFP). Using periods of each day (6 total periods) to create Poincare Plots we assessed short term vagal variability and compared variability between high ($n = 10$) and low job strain ($n = 22$) subjects as well as subjects categorized as exhausted ($n = 4$).

A repeated measures ANOVA controlling for age confirms reductions in variance of cardiac vagal activity in high job strain subjects (.01), with further reductions in subjects reporting exhaustion ($p = .001$). This analysis supports the hypothesis that job strain and exhaustion are associated with reductions in cardiac vagal – or system level – variance. Further work to establish the relationship between adaptive capacity and system level variance and its role in chronic disease development from job strain is required.

Author(s): Heather K. Scott et al.

Title: The Health Consequences of Underemployment

Format: Paper

Structural shifts in industrialised economies have led to changes in labour markets, work systems and employment relationships. Part of this trend has been the rising prevalence of underemployment. This study investigates the relationship between underemployment (across three definitions of the construct) and health. It also examines whether the potentially health-damaging effects of exposure to underemployment vary according to socio-demographic characteristics constitutive of social location.

Drawing on data from a Canadian panel survey, the analysis investigates the impact of exposures to underemployment on several health-related outcomes namely, levels of general and functional health and the probability of transitioning to worse health. We use a statistical procedure that can accommodate the special properties of panel data, including the need to adjust for the correlation of multiple individual observations taken across time. We also outline several steps that we have taken in the analysis to control for the problem of reverse causality (i.e., where poor health precedes exposure to negative employment experiences), lending credence to our findings.

Our results show that men and women, both older and younger, experience adverse health consequences arising from exposure to underemployment. The results from the analyses that investigate the impact of layering gender and age bracket with other markers of social location (single, visible minority, level of educational attainment) indicate that younger and older females in these locations are particularly susceptible to poor health outcomes. Being single and a visible minority magnified the impact of earnings and hours underemployment for these groups. Oddly, certain social locations appeared to be protected by exposure to underemployment, specifically single females. This unexpected result may be due to social welfare programs that become available to individuals for whom the labour-market does not provide adequate employment opportunities. Alternatively, for women in low status jobs, full employment may actually prove harmful if employment conditions are undesirable or hazardous to psychological or physical health. Hence underemployment may be beneficial if it means less exposure to deleterious employment conditions. In the case of single mothers, for example, full employment may be overtaxing because of the need to care for children and manage a household alone in addition to holding down a job. The implications of these findings for the health and well-being of the North American labour force are discussed in relation to the growing presence of vulnerable groups (e.g., women, older people, and immigrants).

Session: F12

Abstract No: 085

Author(s): Margaret M. Weden, PhD, Robert Wood Johnson Foundation Health & Society Scholar

Title: Racial, Ethnic, and Gender Differences in Workplace Conditions over the Life Course and the Development of Chronic Disease

Format: Paper

During early adulthood, differences in health behaviors emerge that are precursors to inequalities in health and mortality experienced in later life. The relationship between work-related resources and exposures and the precursors of cardiovascular disease provides an excellent example of how health becomes socially stratified. I describe the differences in work-related psychosocial exposures over adulthood by gender, race, and ethnicity; I then consider how these exposures --controlling for material and social resources and selection into different work environments-- contribute to the racial, ethnic, and gender disparities in health.

Data for this study come from the U.S. National Longitudinal Survey of Youth 1979-2000 and the National Survey of Midlife Development in the United States 1995-1996. The psychosocial exposures experienced in different occupations are conceptualized and measured using four "ideal job types" (active, low strain, passive, high strain) that describe job demands and latitude (Karasek & Theorell 1990). The effects of psychosocial exposures at work for young adults aging into midlife (ages 15-40 years over 1979-1998) are related to the precursors of chronic disease (smoking cessation and BMI) using discrete-time hazards models. The role of material and social resources (education, salary, benefits, co-worker/supervisor support) are assessed congruently with workplace psychosocial exposures. At the start of their working careers, men and women (regardless of race or ethnicity) most commonly work in passive jobs. With increasing age, European American men transition out of passive jobs and become heavily concentrated in active jobs. European American women and Hispanic women become concentrated in high strain and active jobs, and Hispanic men become concentrated in low strain jobs. In contrast, African American women remain in passive jobs or transition into high strain jobs, and African American men remain the most likely to be in passive jobs. The four ideal types of workplace conditions have unique relationships with the precursors of chronic disease. These are instructive for understanding racial, ethnic and gender disparities in health.

The analyses underscore the relevance of policy that increases human capital, reducing racial, ethnic and gender differences in occupational attainment. It also highlights the need for workplace health programs that extend beyond individual interventions to address workplace conditions.

Session: P3

Abstract No: 086

Author(s): Tania Araujo, Robert Karasek

Title: Reliability and validity of the Job Content Questionnaire (JCQ): a empirical test in a developing country comparing formal and informal jobs.

Format: Paper

The Job Content Questionnaire (JCQ) is an instrument designed to measure psychosocial characteristics of jobs and has been widely used to evaluate association between psychosocial working conditions and chronic disease, especially CHDs, in developed countries. However, the JCQ performance in developing countries requires further research.

This study evaluated JCQ performance in a Brazilian population, considering formal and informal jobs. A cross-sectional study was carried out in a random sample of >15 years old residents in the urban area of Feira de Santana City, Bahia. The JCQ recommended version (49 questions) was used. Standard psychometric properties of JCQ were evaluated in order to support its construction, reliability, precision and predictive power. The JCQ performance was analyzed considering: descriptive analysis (means and standard deviations), correlation matrix among scales, internal consistency, construct validity, and capability of identifying different risk work situations. We studied 1,311 workers: 65.9% had informal jobs; 659 (50.3%) were male and 652 (49.7%) female. Informal job frequency was similar among male (65.4%) and female (66.5%). Workers with formal jobs earned greater salaries and had better education levels. Averages of JCQ scales were similar among workers with formal and informal jobs, except for decision authority (formal job=31.9; informal jobs=34.5). Averages of the several JCQ scales used did not differ substantially from those obtained in European studies, albeit were slightly lower in the Brazilian case. Comparing correlation coefficients of JCQ scales, we observed similar patterns for formal and informal jobs. In general, the Cronbach's Alpha coefficients revealed performance similar to other large sample studies, conducted in developed countries. The coefficients were relatively similar for formal and informal jobs. The factor analysis revealed a high consistency with the theoretical model.

This is the first study to evaluate the JCQ performance in a developing country, comparing formal and informal jobs. The JCQ presented a good global performance and it did not differ substantially from those observed in other studies. These results suggest that JCQ can be used in developing countries studies, presenting good performance to evaluate psychosocial working conditions in formal and informal contexts.

Session: T23

Abstract No: 091

Author(s): Bongkyoo Choi, Robert Karasek

Title: Application of Differential Item Functioning(DIF) analysis to the Job Content Questionnaire(JCQ)

Format: Paper

Objective: To apply a new psychometric method, DIF analysis, to the original JCQ base data set in order to test item and scale invariance across socio-demographic variables and industries in a new manner. This would serve a baseline reference standard for sophisticated DIF analyses of scale-item consistency for the new scales of the JCQ 2.0 in future cross-national comparisons.

Methods: The U.S. population survey on which the JCQ is based, U.S. 1972 QES database was used. 22 items were tested for skill discretion (6 items), decision authority (3 items), psychological demands (5 items), supervisor support (4 items), and coworker support (4 items) scales. The sample was split into two random subsamples(N= 775 and N=746, respectively) for cross-validation. For DIF statistics, given the same scale scores, partial gamma coefficients were calculated between item and several variables of interest (sex, age, education, and industry). The DIF was defined as items with cumulative partial gamma outside the interval (-0.21 to 0.21) and significantly different from zero, or significant variations between the partial gammas for each scale score. To test the practical importance of DIF at the scale level, scale means were compared in both occasions, with DIF and without DIF.

Results: 3 of 22 items showed DIF between male and female workers. 2 of 22 items showed DIF between age groups (< 45 yrs old and ≥ 45 yrs old). 2 of 22 items showed DIF between education groups (≤ 12 years of education and > 12 years of education). 3 of 22 items showed DIF between manufacturing and whole sales-and-trade industries, and between manufacturing and entertainment-and-recreation (including health care workers) industries. However, no DIF items turned out to be substantial DIF at the scale level.

Conclusions: The 1972 QES data, without substantial effects of DIF at the scale level, is a reliable anchor for future studies of testing the quality of translated JCQs and of comparing international psychosocial work hazard. DIF analysis would be also a useful technique in the future studies.

Session: T21

Abstract No: 092

Author(s): Bongkyoo Choi, Robert Karasek, Per-Olof Ostergren, Marco Ferrario, and Patrick de Smet for the JACE* Study Group.

Title: An orthogonal relationship between social class gradient and job strain axis of the Demand-Control Model

Format: Paper

Objective: To examine the relationship between the job strain axis of the Demand-Control Model and the social class gradient to determine whether it is colinear or independent, and to examine the implication in explaining work-related risk.

Methods: The JACE-JCQ database (N=37,161, 35% women and 65% men workers) was weighted for the comparability of the scale scores across eight samples from five countries (Belgium, France, Italy, The Netherlands, and Sweden) that had different occupation compositions, but broad occupation spectrums. Social class were defined based on the International Standard Classification of Occupation (ISCO)-88 one-digit major groups**. The distribution of psychological job characteristics by social class and sex was plotted according to Demand-Control Model, using the means and standard deviations of decision latitude and psychological demands of the JACE.

Results: The social class gradients of both male and female samples follow the active-passive diagonal of the demand-control model (from high status in active work-high demand together with high control-to low status in passive work: low demands and low control), consistent with other previous studies. Different distribution patterns of social class on the demands and decision latitude dimensions by sex were also observed. The male distribution is shifted toward higher decision and lower demands in comparison to the female plot, showing a relatively high proportion of high strain jobs among low status females.

Conclusion: In many industrialized societies the job strain construct can be orthogonal to the primary social class gradient in job characteristics. This would imply that social class-based analyses alone of the occupational illness burden could seriously underestimate the full work-related risk -unless a "job strain-like" gradient is also examined (i.e., high class with low job strain vs. low class with high job strain).

*Job Stress, Absenteeism and Coronary Heart Disease European Cooperative Study

**Group 1 (i.e., manager), Group 2 (i.e., professionals), Group 3 (i.e., associate professionals), Group 4 (i.e., clerks), Group 5 (i.e., service workers), Group 7 (i.e., craft workers), Group 8 (i.e., assemblers), and Group 9 (i.e., elementary occupations).

Session: F23

Abstract No: 093

Author(s): Leonor A. Cedillo Becerril, Gabriela Grijalva Monteverde

Title: Analysis of Psychosocial Risk Factors and Trends of the Employment Market in Hermosillo, Sonora. México.

Format: Paper

Hermosillo has 546,000 inhabitants, 213,000 with economic participation, main sectors of activity are technical and professional services, manufacture industry and commercial activities. Several maquiladora plants are settled there, including an assembling plant of Ford co.

An employment survey was conducted in this city, sample was determined following INEGI (Instituto Nacional de Estadística, Geografía e Informática) statistical procedures. More than one thousand people participated in the survey were currently employed. Questions regarding demographic information (sex, age, education) economic sector, job position, seniority, job content, job insecurity and job satisfaction were obtained.

Analysis followed up determining the frequency of job strain, percentages of men and women and frequency of job insecurity in different occupations, job positions and types of contracting. Reliability of all the scales was conducted and analyzed by level of education and gender. Thirteen items related job satisfaction included in the survey, were tested through factor analysis and two scales were performed, job satisfaction was analyzed as organizational outcome. Three alternative computations of job strain were conducted to get three levels of job strain.

Authors discuss the prevalence of adverse and beneficial psychosocial factors across different sectors, getting a picture of their location in the employment market and the relative importance of gender, age and social class.

Author(s): Omolade E,Asaye I,Agbaje B

Title: Effect of work environment on cardiovascular diseases:A Nigerian case.

Format: Paper

The effect of obesity and by extension overall lifestyle, habits and the work environment ie whether one engages in sedentary work or otherwise as a risk factor in the etiology of cardiovascular diseases has long been noted.

An analysis of the attendance at a staff clinic serving government workers at the civil service headquarter office complex and the governor's office in a state capital in Nigeria was done to establish this relationship. The data of all the people with cardiovascular symptoms who presented at the clinic was taken over ten(10) months period. Of all the 100 attendants, 65 were females ie 65%. 20 of these women were senior nursing officers working at the nearby medical center. Of the 35 men who presented with symptoms, 20 ie 57.1% of them were top management staff. The remaining men belong to the middle and lower cadres. The age range of the attendees was between 25 years and 62 years old. 60 of the workers were 40 years old and above. 70% of the male workers smoked cigarettes though not at the same volume! Of all the patients that presented at the clinic, 69% of them were having higher than normal Body Mass Index (BMI). In order to determine likely people with cardiovascular diseases, the blood pressure and the electromyogram were said to be deviations from normal.

CONCLUSION: The large percentage from the women who had cardiovascular diseases were nurses, majority of who are obese and due to their work schedule are sedentary. The top management officers also are more often than not sedentary. This also has a direct relationship with the habit of smoking. Though a modest attempt, the study supports the relationship between work environment and cardiovascular diseases. The limitation of the analysis is in the determination of who is said to be suffering from cardiovascular diseases, and the non consideration of the interplay between these factors and other factors like tribe, eating habit and attitudes towards health care.

Session: W13

Abstract No: 095

Author(s): Robert Karasek, PhD; Sean Collins, ScD

Title: A Test of the Stress-Disequilibrium Model's Structural Hypothesis: Depletion of Heart Rate Variability Control Capacity (HFPApEn) Demonstrated During Work/Rest Day Stress

Format: Paper

The Stress-Disequilibrium Model claims that a "central controller" regulates the body's response to environmental challenges in a manner that corresponds to the thermodynamic analytic framework - implying absolute limitations in human physiological control capacity to respond to complex environmental challenges (work stressors) - and risk of chronic disease risk when these limits are overwhelmed. Our "central controller's" (CNS, etc.) capacity limitation would appear as a decrease in Entropy of its control signals, moving toward a state of fewer remaining available options for adaptive response and thus more order (in this case dysfunctional rigidity) in its control responses.

Empirical analysis of heart rate variability (HRV) generates easily measurable evidence of the controller's activity relevant for cardiovascular health. The central "controller" is claimed to be parasympathetic control center in the brain stem (measured by the high frequency power (HFP) of the heart rate signal) via the vagus, and the physiological response which is "controlled" in this case is the heart rate (HR) itself, directly measured.

The controller's signal (HFP) is predicted to display a decrease in entropy at the end of the active period of the 24 hour day. To restore control capacity, a refresh process at a non-demanding time period (sleep) would be predicted occur and represent an increase in entropy of the controller during rest periods at the active day's end: corresponding to a re-expanded number of states available for control response. Precisely the opposite pattern is predicted for the physiological state which is "controlled," the HR.

Using data from 36 mid-aged male subjects during 48-hour Holter monitoring on a work day and subsequent rest day, the predicted patterns are observed using heart rate as an overall measure of the variability of the human system response ("the controlled"), and using vagal control of the heart (HFP), as a measure of "the controller," based on Pincus's 1992 measure of Approximate Entropy (ApEn). For "the controller," the entropy of the HFP (HFP ApEn) signal does decrease during the course of the day and reaches a minimum as the end of the day approaches (however, a partial minimum is observed already at the end of the workday period). Then, as predicted, HFP entropy increases strongly during three segments of the sleep process to reach a maximum upon waking.

Using other data (Yum, et al, 1999) on HR - "the controlled" - the predicted opposite pattern of entropy of the heart rate signal (HR ApEn) during the 24 hour daily cycle for thirty healthy subjects averaged is displayed: a maximum as midnight approaches, and a minimum at approximately 6 am.

Session: T23

Abstract No: 096

Author(s): Robert Karasek, PhD

Title: Status of JCQ 2.0: Results of the JCQ Workshop March 8, 2005

Format: Paper

Three Job Content Questionnaire International Workshops have taken place in a three-year period devoted to assessing and developing a revised JCQ. The major critique of the JCQ remains "omission." Over the last two decades major changes in the political context of work in the global economy, and the service nature of work in the developing economies potentially require JCQ modifications. A modular instrument may also be needed to accommodate the differing needs of job design practitioners; sophisticated researchers, and policy analysts with international comparability goals.

The primary new area needed represents a combination of three factors which links macro-level decision latitude, institutional job insecurity factors, and macro-level social support concepts - possibly into a single, integrated extension. (1.) Macro-level decision latitude implies a new, more general notion of control, now articulated in the Stress-Disequilibrium Theory - consistent with the D/C model and supporting multiple levels of social explanation. (2.) Company-policy-based job insecurity and a Society/economy based job insecurity (as well current individual's job insecurity) are all areas of active risk areas in the neo-liberal global economy. (3) Many of the "supports" that would provide a stable employment platform are just that: measures of Macro level social support (provision of "entitlement benefits to organizational "citizens," social trust through fairness, avoidance of threats; congruent social value platform, social capital at individual firm and community).

A second area of change is needed to clarify the meaning of the psychological demand dimension and to more sensitively measure the mental work load costs of engaging in complex, strategically planned, and emotionally engaging social behaviors in organizationally complex situations: a requirement for a new "emotional load" scale. Both the physical demand scale and the current psychological demands scale (mainly a "quantitative load" dimension) may need to drop/add some questions to increase accuracy and efficiency. Altogether, the new extensions could be accommodated within the current 49 question instrument length by cuts in unused, inaccurate, or inefficient questions to yield a reduced core of 25 -30 original JCQ questions to maintain compatibility.

New methodologies being discussed are: (1) use of company-wide sources of information can be appended to the worker response information - gathered independently of the questionnaire - to reduce questionnaire size by 30 to 40% and enhance objectivity of assessment, and (2) psychological demand assessment packages developed for specialized occupational groups and industries.

Session: W12

Abstract No: 098

Author(s): Pikhart H, Bobak M, Kubinova R, Malyutina S, Pajak A, Marmot M

Title: The association between psychosocial characteristics at work and problem drinking in three Eastern European urban populations.

Format: Paper

Objectives: Psychosocial factors at work are thought to influence health partly through health behaviours. We have examined the association between effort/reward imbalance and job control and several alcohol-related measures in three eastern European populations.

Methods: A cross-sectional study was conducted in Novosibirsk (Russia), Krakow (Poland) and Karvina (Czech Republic). The participants completed a questionnaire that included effort/reward at work, job control and a number of socio-demographic variables. Annual alcohol intake, annual number of drinking sessions, the mean dose of alcohol per drinking session and binge drinking (≥ 80 g of ethanol in one session) at least once a month were based on graduated frequencies in the questionnaire. Data were also available on problem drinking (at least 2 positive answers on CAGE questionnaire) and negative social consequences of drinking. All male participants in full employment ($n=694$) were included in the present analyses.

Results: After controlling for age and centre, all indices of alcohol consumption and problem drinking except the mean dose per drinking session were associated with the effort/reward ratio. Adjustment for material deprivation did not change the results but adjustment for depressive symptoms approximately halved the estimated effects. Job control was not associated with any of the alcohol-related outcomes.

Conclusions: The imbalance of effort-reward at work is associated with increased alcohol intake and problem drinking. The association appears to be partly mediated by depressive symptoms, which might be either an antecedent or a consequence of men's drinking behaviour.

Session: T24

Abstract No: 103

Author(s): Sean Collins, ScD; Robert Karasek, PhD

Title: Within Subject Cardiac Vagal Responses to Work & Rest Day Strain

Format: Paper

This paper tests the hypothesis that cardiac vagal control throughout the day, when controlling for relevant covariates, will be affected by job strain as reported on an activity diary. In addition, it was hypothesized that cardiac vagal activity will vary between subjects based on macro level job characteristics as measured by a standard questionnaire assessment. Thirty-six males between the ages of 35 and 60 years and free of known heart disease were selected from a larger longitudinal study of healthy subjects and cardiovascular risk based on responses to a subset of questions from the Job Content Questionnaire (JCQ). Subjects were monitored with an ambulatory Holter electrocardiograph. The monitor allowed subjects to continue on with normal daily activities with minimal distraction while recording cardiac electrical activity. The protocol required monitoring to begin the morning of a workday followed for 48 continuous hours through the following rest day and subsequent morning. Diary questions were based on demand / control model assessment of occupational stress and are often analogous to JCQ questionnaire items.

Psychosocial strain as measured by the diary during two days of monitoring was significantly associated with cardiac vagal control using within and between person based hierarchical modeling analysis ($p = .03$). Social support was also significantly associated, although, negatively with vagal control which is contra hypothesis ($p = .05$). An interaction between diary level strain and social support approached significance ($p=.07$) with a hypothesis supporting positive association with vagal activity. These findings are found after controlling for position, exertion and age. In addition, using the Job Content Questionnaire (JCQ) to assess decision latitude, low workplace control based on a single overall rating of each subjects' permanent job, is significantly associated with reduced between-subject vagal cardiac activity ($p = .04$). The use of multilevel modeling has allowed us to test for the influence of psychosocial conditions within each subject with diary strain, social support, exertion and position while also testing the between subject effects of age and JCQ assessed decision latitude.

Session: T13

Abstract No: 106

Author(s): Haiou Yang, Peter Schnall, Maritza Jauregui, Dean Baker

Title: Occupation and Job Characteristics Variations in Self-Reported Hypertension of Working Population of California

Format: Paper

Background and Significance. American workers are working longer hours than workers from a number of European and Asian countries. Studies show that long work hours increase levels of the general mortality and have an impact on a number of adverse health outcomes, including cardiovascular disease, diabetes, hypertension, disability retirement, and self-reported physical health and fatigue. Studies done especially in Japan show positive associations between long working hours and hypertension. Occupation has often been used as a variable to depict work environment and job characteristics as well as socioeconomic status in numerous studies of health. However, the relationship between occupation and hypertension is unclear. This paper presents an analysis of occupation, long work hours, self-reported hypertension on the working population in California, US.

Methods. The data set used for this study comes from the Public Use File of the 2001 California Health Interview Survey (CHIS). Total number of individuals included for the analysis is 44, 365. The population used for this analysis was defined as the working population aged 18 to 64.

Results. The logistic regression analysis showed that compared with working fewer than 40 hours per week, those who worked more than 50 hours per week were 13% more likely to report hypertension (CI: 1.01-1.28, $P<.02$), after adjusting for confounding variables, including demographic, biological risk factors, and SES. The logistic regression analysis also indicated no significant occupational variations in self-reported hypertension, after adjusting for confounding variables.

Conclusion and Discussion.

The findings of this analysis provide evidence of the positive association between long work hours and hypertension in the US working population, supporting the research previously done with Japanese workers. Classifications of occupation in a large population-based survey like the CHIS could not depict the specific job characteristics and exposures of psychosocial factors in the work environment used to predict hypertension. Part of the problem may due to high degree of subjectivity in self-reporting and grouping of occupations.

Session: F12
Author(s): Haiou Yang, Maritza Jauregui, Peter Schnall and Dean Baker
Title: Work and Cardiovascular Health among Vietnamese Americans: A Pilot Study
Format: Paper

Abstract No: 107

Background and Significance. The role of the workplace in cardiovascular disease among Asian Americans, such as Vietnamese, has not been well studied. This project represents an initial attempt to study a special population, Vietnamese Americans, on their work and cardiovascular health.

Methods. Guided by the community partnership perspective, the UCI Center for Occupational and Environmental Health collaborated with the Orange County Asian and Pacific Islander Community Alliance to carry out the study. A purposeful sampling method was used. The occupational composition information from the 2000 census data for the Vietnamese population in Orange County in California was used for determining occupation groups in the participant recruitment. Three focus group meetings were conducted, including a total number of 28 participants, with 12 male, and 16 female from various occupation backgrounds. Two focus group meetings were conducted in Vietnamese and one was conducted in English. Extra efforts were devoted in the transcription and translation of the focus group data. In the process of careful examinations of the raw texts, themes and clusters of information were uncovered. Themes or clusters of information in the raw texts were manually sorted, discussed, and confirmed among the multiple members of the project team. In addition, the study tested the feasibility of using a portable wrist blood pressure monitor (Omron 637) for blood pressure assessment.

Results. The major themes and categories uncovered from the focus group data included health concerns of the community, pattern of jobs; job stress, family, and attitudes and beliefs toward work and hypertension. The information from the focus groups suggest that there are substantial occupational heterogeneities, and a pattern of long work hours and multiple jobs among Vietnamese. The findings indicate that the family plays a complicated role in work and health among Vietnamese. The pilot study demonstrated the feasibility of using the blood pressure wrist monitor to measure blood pressure at work.

Conclusion and Discussion. The pilot project demonstrated that using a community recruitment approach successfully provided access to a population in which it was feasible for people to independently assess their own blood pressure while at work. This study emphasizes the importance of the community partnership approach, and calls for a need for future research on work and health in the Vietnamese community. The general warmth and support received from the community provided encouragement and reinforcement for the research team to conduct further studies in this area.

Session: T23
Author(s): Maritza Jauregui
Title: Measurement Issues Involving Social Support
Format: Paper

Abstract No: 108

Session: T12

Abstract No: 109

Author(s): Peter Schnall, Kanan Patel-Coleman, Dean Baker, John Froines
Kanan Patel-Coleman
Maritza Jauregui
Paul Landsbergis
Dean Baker
Peter Schnall, Kanan Patel-Coleman, Maritza Jauregui, Paul Landsbergis, Dean Baker and John R. Froines

Title: Future training needs to address the problem of work related psychosocial stressors and health

Format: Paper

Psychosocial stressors (e.g., job strain, effort-reward imbalance, work characterized by threat avoidant vigilance) at the workplace play an important etiologic role in a number of chronic illnesses including repetitive motion injuries, psychological distress (e.g., anxiety, depression, burnout and demoralization) and cardiovascular disease (including hypertension). Moreover, these same risk factors contribute to both a loss of productivity and an increase in the costs of doing business by increasing sick leave and turnover, workers' compensation, disability claims and absenteeism.

A comprehensive program is needed to improve the psychological well-being, cardiovascular health and general health of working people which requires 1) periodic surveillance of workplaces, 2) early detection with referral to evaluate and treat individuals with manifestations of work-related mental and physical health problems and 3) interventions at the workplace intended to reduce exposures.

Such a program will require a training curriculum for occupational health graduate students and professionals to enhance their awareness of the role of psychosocial work factors in the etiology of psychological and physical disorders. Graduate students will need skills in conducting surveillance, detecting psychosocial exposures and obtaining a psychosocial work history from employed people. Training for practicing professionals should also focus on developing appropriate clinical skills, necessary for the detection, evaluation and treatment of work-induced CVD and other stress-related diseases. Both groups will need training in implementing appropriate worksite interventions and prevention strategies.

The Psychosocial Stressors in the Workplace program offered through the UCLA and UCI COEH's demonstrates three distinct approaches for constructing a program of training for health professionals and graduate students.

1) For graduate students in the UCLA SPH a full term course on work and health is offered (30 hours) which covers the areas outlined above. This core course will eventually be expanded into a full track by including two additional courses, one on intervention/prevention at the workplace and a research practicum involving surveillance.

2) For graduate students in industrial hygiene, occupational health nursing and occupational medicine specializing in occupational health located within the NIOSH supported ERC (Education Research Center) a different approach has been utilized with introductory materials on psychosocial stressors offered to all 3 disciplines within core courses offered to all ERC students. For clinical training, a mini-course on occupational cardiology is offered to medical residents and occupational health nurses while a mini course on worksite surveillance is being planned for industrial hygiene students.

3) Finally, for practicing occupational health professionals all day seminars and forums on psychosocial stressors have been offered in each of the last 3 years. Plans are underway to offer thru the UCLA continuing education program courses similar to those currently offered in the UCLA SPH.

Author(s): Michael Ertel, Eberhard Pech, Peter Ullsperger

Title: Stress and health in freelance media workers

Format: Paper

Reorganization, downsizing, outsourcing and the steady growth of non-standard work contracts are observed in many countries today. These trends constitute relevant stressors in a globalized economy and may translate into the risk of heart-attack and other stress-related health problems, which has recently been demonstrated for the case of downsizing (Vahtera et al. 2004). In this context, our contribution analyses the associations of work stress with health risks in a group of freelancers (N=290) working in the media industry in Germany. This sector is a "forerunner" of flexible employment with a workforce characterized by fluent transitions between different types of contractual relationship, long working hours, high market pressure and an inherent experience of insecurity. However, freelancers still represent an underresearched target group in Occupational Health and Safety.

Freelance media workers were accessed in cooperation with the union of media workers, and a self-report questionnaire was administered. The response rate was 20 %.

The measurement of work stress is based on two stress models, the Effort-Reward Imbalance model (ERI) by Siegrist and the model of Job Strain by Karasek. In addition, the concept of total workload (combination of paid and unpaid working hours) was included. With regard to health effects, we used the measure disturbed relaxation ability which may be interpreted as a psychosocial marker of heart disease risk. This measure is strongly correlated with delayed recovery of stress-related physiological parameters (Richter 1994). 34 % of freelancers were classified as suffering from poor health in terms of disturbed relaxation ability. The following covariates were included into the analysis: age, education, income, marital status, BMI, smoking and regular physical activity.

To analyse associations between psychosocial working conditions and poor health, crude and multiple logistic regressions were calculated. Poor health (disturbed relaxation ability) is significantly associated with each of the three hypothesized stressors (Crude OR for ERI: 6.1, for Job Strain: 3.2, for Total workload: 5.5). When controlling for all potential confounders, the following ORs resulted: 4.2 (ERI), 4.6 (Total workload), 2.1 (Job Strain). Combining the effects of both stress models showed a significant increase in prediction of poor health (OR 8.0). Separate analyses for women and men showed that the health effect of total workload was much stronger in women (OR 7.3) than in men (OR 4.8).

In summary, this pilot study highlights health risks of "flexible" (boundaryless) working conditions of freelancers. The low return rate limits the generalizability of our results; however, this not only reflects a methodological problem, but highlights the growing challenge researchers face when trying to access a dispersed and individualized workforce. Under these conditions, detection and prevention of work-related illness remain a challenge and deserve further attention.

References:

Author(s): Kumi Hirokawa; Akizumi Tsutsumi; Kazunori Kayaba

Title: Psychosocial factors and plasma fibrinogen in Japanese female and male workers

Format: Paper

The aim of the study was to explore the association between psychosocial factors and plasma fibrinogen levels in a Japanese working population.

Of the Jichi Medical School Cohort study database, a multi-center study designed to explore cardiovascular risk factors of Japanese population, 1942 female and 1794 male workers ages 65 and under for whom a plasma fibrinogen measure was available were subjected to this analysis. Plasma fibrinogen levels were determined with a one-stage clotting assay kit. Sociodemographic and behavioral variables were obtained by a standardized questionnaire. Occupational status and educational attainment were examined as relevant indices of socio-economic status considering possible confounders. Serum lipid profiles and C-reactive protein were also taken into account. Despite of the significantly higher prevalence of aged and postmenopausal status, women in managerial status had significantly lower plasma fibrinogen levels than did the counterpart subordinate employees (age adjusted geometric mean = 221.4 mg/dl and 228.1 mg/dl, respectively, $p = .007$). Even after hypothesized plasma fibrinogen correlates had been adjusted for, the occupational status was independently associated with plasma fibrinogen concentrations ($p = .000$). In men, no significant association was found between occupational status and plasma fibrinogen. However, psychological job demand and job strain—a combination of high demand and low control over work—was significantly correlated with plasma fibrinogen ($p = .002$, and $.036$, respectively). Educational attainment was not associated with plasma fibrinogen levels both in women and men.

In conclusion, occupational characteristics were associated with plasma fibrinogen levels in Japanese workers, which may imply social inequality of the plasma fibrinogen distribution in Japanese female workers and suggest gender difference in the association.

Author(s): Jinky Prado-Lu

Title: Organizational factors that are associated with Hypertension among Women Workers in Industries that have accommodated Information Technology

Format: Paper

The Philippines has established many export zones as a response to the Structural Adjustment Programs of the World Bank in order to stabilize its economy. The study aimed at looking into the problems caused by interaction of organizational factors such as job autonomy, content of job, nature of task, hazard exposure and management styles to cardiovascular diseases among women workers. This was conducted in an export zone involving 31 electronics and garment factories that have accommodated IT and an interview with 613 women workers. The study showed that information technology such as numerically controlled equipments, controllable programmers, robotics, automated design and production systems increased the pace of work and stress among workers ($p=0.05$). On the nature of task, the most prevalent issues among workers in the electronics industry included: need to upgrade skills, repetitive work, pressured in doing work, fast paced work and that work entailed both physically and mentally demanding. The same pattern can be seen in the garment industries. The need to upgrade quality accounted for 79.7% in both industries that have accommodated information technology, and 44.6% said that they experienced conflict between work and home.

The study showed that hypertension is common among workers who are involved in routine work and are closely being watched by their supervisors. Workers under close monitoring have higher chances of having hypertension. Industries that lack good health and safety policies and provisions are more likely have cases of hypertension among workers.

Hypertension	Coefficient	Odds Ratio	Standard Error	z	P> z
Interaction between presence of Repetitious job and closely					
Watched by supervisors	0.96	2.61	0.88	2.82	0.01
Small industry	-1.20	0.30	0.16	-2.26	0.02
Close monitoring	1.34	1.26	0.06	-5.63	0.00
Presence of health and safety	-2.15	0.12	0.03	-8.21	0.00
Constant	2.69	0.56	4.83	0.00	

The study also showed that the characteristics now of the new workplace are: 1.) information technology intensive work; 2) fast pace of work; 3) the need for upskilling; 4) burnout; 5) chronic sleep debt; 6) super-speed communications lead to time pressure and haste; 7) new forms of illnesses that could not be differentiated such as new cancers and allergies; 8) information overload; 9) Extended overtime and working days; and coexistence of old and new exposures and risks. The study showed that there is an interaction between organizational factors and management style with illnesses such as hypertension. The study proposed for a massive review of the existing regulations for work and the relations between organizational psychology and occupational diseases. This study has policy implication and can serve as a basis for advocacy work and program implementation for the promotion of occupational health.

Session: W11

Abstract No: 113

Author(s): Ellen Rosskam, MPH, Ph.D,

Title: Work-related stress: A 21st century global disease

Format: Paper

The health risk of poverty is the biggest risk factor for stress and related diseases: cardiovascular disease, respiratory diseases, ulcers, rheumatoid disorders, psychiatric diseases and various types of cancer, with low socioeconomic status groups having significantly higher disease prevalence. Work-related stress is identified as a 21st-century disease, due in part to labour intensification, competitive pressures, time-squeeze, modern technological innovations, lack of worker control in jobs. Findings from ILO household surveys of workers in developing and transitional countries show worsening working conditions in most countries, combined with growing life insecurities for workers and reduced ability to cope with the stressors, a powerful combination for stress and stress-related ill health. Lack of social support is a crucial factor in increasing stress-related ill health. Heart attacks, suicide and strokes are expected to be the top occupational diseases of the 21st century. Depression is now one of the world's major causes of premature death and disability, including suicides and death from overwork in many countries. Stress affects workers in industrialized economies subject to work intensification management practices. "Time insecurity" is a global phenomenon, magnified by labour intensification, increased commuting time, growing insecurities. In many countries, workers' greatest concern is access to basic health care, a leading cause of household debt, with the majority of families in Africa and eastern Europe reporting difficulty paying for basic health care.

Flexible labour relations are associated with worker health deterioration (higher injury rates, exposures, work-related stress, diseases) with only a fraction of stress-related lost work recorded as such. Economic liberalization is associated with less statutory regulation, worsening working conditions, increasing stress, declining workers' health. Women workers are more disadvantaged, concentrated in jobs with less protection. Most workers in developing and transitional countries have to bear the costs of work-related accidents or illnesses, with no benefits for incidents, bearing the stress of working when ill, lacking paid sick leave, fearing income or job loss. Harassment in various forms causes stress and related ill health among women workers in particular, with women wage workers in many countries suffering the effects. Self-regulation and weak forms of collective voice have eroded workers' health and safety in some countries. Strong voice representation is associated with protection of workers' health/well being. Strengthening collective voice is key to improving working conditions and protecting workers' health.

Session: T22

Abstract No: 117

Author(s): Ed Avol

Title: Mobile Workers and Mobile Sources: Understanding Exposure

Format: Paper

Explains the relevant issues of exposure to diesel exhaust: what is 'diesel'; 'diesel' as a mixture; relation of 'diesel' and 'PM'; contributions of sources and levels of exposure, in particular mobile workers (versus ambient exposure). The port related work/occupations could be used as the focus of examples. Measuring diesel / PM exposure. Thus, the audience will know the type of exposure that will be relevant to understand the next presentations

Session: T22

Abstract No: 118

Author(s): David Diaz-Sanchez

Title: Diesel, Particles, and Cardiovascular Health: The toxicological perspective

Format: Paper

This presentation discusses the toxicological effects of diesel particles (and 'PM mixtures') on markers of cardiovascular health. It provides a biological mechanistic model of cardiovascular actions and addresses open questions. The talk does not include the epidemiological evidence of effects.

Session: T22

Abstract No: 119

Author(s): RALPH DELFINO

Title: Acute and Long-term Cardiovascular Effects in Workers and the General Population

Format: Paper

Gives an overview of the 'diesel exposure' occupational studies (in particular among 'mobile workers' such as truckers) and the link to the environmental epi studies with diesel or markers of diesel. Does epidemiological research in humans confirm the toxicological model? Open questions

Session: T22

Abstract No: 120

Author(s): Sean Collins

Title: Psychosocial Factors and Cardiovascular Changes

Format: Paper

This presentation outlines the findings that reveal cardiovascular changes associated with psychosocial job stress. Does research clearly demonstrate direct cardiovascular changes associated with a "stress" response, or is there rather a systemic response mediated through the autonomic nervous system that underlines cardiovascular change? What are the benefits of outlining any systemic response characteristics for investigating job stress and possible stress – particulate based interactions?

Hearing susceptibility for noise exposure presents in working population. Hearing susceptibility for noise exposure might be associated with noise induced hypertension. The investigation includes seven large scale of chemical fertilizer factories in China with 1168 male and 425 female workers, aged 30.2 7.7 (18.1~58.1) years, working years 9.5 6.7 (1~35) years. Sound pressure level of noise, noise exposure history, hearing thresholds and blood pressure were measured or collected for each worker. Cumulative noise exposure (CNE) was calculated by sound pressure level and noise exposure history with equal energy rule. Auditory thresholds from 500Hz to 6kHz for each ear were measured after leaving noise environment more than 16 hours. Hearing thresholds was adjusted by age and gender with ISO 1999:1990 appendix A. The averaged high frequency hearing threshold (AHFHT) for each worker was defined as mean of hearing thresholds from 3kHz, 4kHz and 6kHz of both ears. A linear regression model was created by CNE and AHFHT to get predicted AHFHT. Difference of AHFHT and predicted AHFHT for each worker was used to assess hearing susceptibility. Prevalence of hypertension was 12.1% (193/1593) in the population with a significant dose-response relationship between CNE and prevalence of hypertension. The distribution of hearing susceptibility was -29.8dB to 64.8dB, medium -1.8dB, one peak with left shift in feature. To quarter the population by hearing susceptibility from low to high, prevalence of hypertension was 7.8%, 9.0%, 13.3% and 18.4% with significant by trend chi-square, $P<0.01$. A multiple logistic regression model was applied to adjust potential confounding effects from age and gender. The odds ratio of predictors were 1.031 ($P=0.007$) for increasing one dB(A) of CNE, 1.454 ($P=0.035$) for hearing susceptibility of more than 50 percent group, 1.069 ($P<0.001$) for increasing one year of age and 2.261 ($P<0.001$) for male in a logistic regression model. By forward method, the odds ratio of hearing susceptibility was no significant changes by other predictors into the model. It suggested hearing susceptibility was an independent risk factor for noise induced hypertension. By backward method, the difference of $-2\log$ likelihood for hearing susceptibility (4.390) was about 30% for CNE (14.276), 13% for age (34.416) and 60% for gender (7.375). It suggested the hearing susceptibility was a slight risk factor for noise induced hypertension.

Session: T11

Abstract No: 123

Author(s): Robert Karasek

Title: Stress-disequilibrium panel

Format: Paper

Panelists: Tores Theorell, Ellen Rosskam, Sean Collins, Robert Karasek

Ellen Rosskam will make presentation about major losses of social support taking place globally leading to increased insecurity among working and non-working people. She will discuss the social policy implications of finding the stronger and more general explanations of "work-relatedness" for the large and increasing chronic disease burden worldwide proposed by the Stress-Disequilibrium Theory.

Tores Theorell will present a brief background on the general explanation of work stress and disease from the physiological perspective of "anabolism and catabolism," and the link to the Stress-Disequilibrium Theory. He will also comment on the complexity of systems dynamic stress physiology research, and the status of "convergence" in explanations in work stress and chronic disease research.

Sean Collins will present on findings related to the Stress Disequilibrium Theory from heart rate variability measurements. Discussing physiology from adaptation to disease, he will raise practical issues for scientific investigation of the Stress-Disequilibrium Theory such as phenotype plasticity, neural networks and dynamic complexity.

The floor will be open for discussion of several broad question raised by the Stress-Disequilibrium Theory keynote, by the panelists', and by the audience. Questions will include:

- a. How strong is the evidence for a new "convergence" in understanding of social working conditions in the global economy, disease prevalence profiles across countries, and consistency in psychosocial workplace risk epidemiological findings across multiple chronic diseases?
- b. What about the Stress-Disequilibrium Theory distinction between focusing on "ordering capacity" rather than focusing on "energy consumption?" Could we "just eat more food" if we are exhausted in the global economy?
- c. Is the evidence clear that low external social control causes a lack of internal physiological control severe enough to cause chronic disease?

Session: K1

Abstract No: 125

Author(s): Tage Kristensen

Title: The Changing Nature of Work and Its Implications for Cardiovascular Diseases

Format: Paper

Modern empirical research on the role of work for cardiovascular diseases now can look back on more than 50 years of systematic studies. As a result of this research effort we now have good evidence about a large number of cardiovascular risk factors in the work environment. As a matter of fact, cardiovascular diseases is the leading work-related disease when looking at numbers getting sick as well as the consequences for the victims. The changing nature of work presents a challenge for the development of this research as well as for prevention. The new developments at the labor markets and in the globalized economy make it necessary to discuss and scrutinize the models and measures used in today's research.

Author(s): Steve Sauter

Title: Changing Organizational Practices and Job Demands in the United States

Format: Paper

Surveillance of the changing organization of work is not a well-developed field of practice or science. Consequently, information on recent trends in organizational practices and job content is fragmentary. The limits of knowledge on how the organization of work is changing will be described, with particular attention to the situation in the U.S. Underlying problems relating to deficiencies in surveillance mechanisms and difficulties in interpretation of surveillance data will be discussed.

Session: P1

Abstract No: 127

Author(s): Peter Smulders and Irene L.D. Houtman

Title: Trends in Job Control & Work Pressure in the European Union

Format: Paper

Aim of the study

Governments and social partners find it more and more important to monitor trends in work and health, to be able to counter negative trends in an early phase. This study has the intention to analyse the trends in Job Control and Work Pressure in the EU during the last decade.

Methods used

Every four to five years the European Foundation for the Improvement of Living and Working Conditions in Dublin has carried out a survey on working conditions in the EU-countries. In 1992 about 12000 workers in 12 countries were interviewed, in 1996 15000 and in 2000 about 20000 workers in 15 countries. They answered standard questions on their work situation and their (work-related) health.

Results

First, analyses of the trends in the EU-countries in Job Control & Work Pressure between 1992-1996-2000 show that the mean Job Control level declined a little between 1996 and 2000. The mean European Work Pressure level increased from 1992 to 1996 and also from 1996 to 2000.

Second, it is concluded that Finland, Sweden, The Netherlands and the UK offer most 'active jobs' (high on control and high on work pressure). Germany, Austria & Greece may be characterised as having a relatively high number of high strain jobs (low control, high pressure). Examples of low strain countries are Belgium and Italy, and a relatively high number of passive jobs are found in Spain and Portugal.

Third, it is found that Job Control is highest in financial and commercial sectors and lowest in industry, construction, transport and hotels & restaurant. Work Pressure is highest in industry, construction and transport. These are the 'high strain' sectors.

Fourth, difference in Job control and Work Pressure between professional groups and types of contract will be presented too.

Conclusion

Economic and technological trends, causing changes in (a) the type of work of work of industrial sectors and (b) the size of industrial sectors, may cause mean changes in Job Control and Work Pressure. Computerisation is one of the forces, leading to increases in Job Control and in Work Pressure.

Session: P1

Abstract No: 128

Author(s): Simone Weyers, Johannes Siegrist

Title: Threats to Contractual Fairness in a Globalized Labour Market: Contributions of the Effort Reward Imbalance-Model

Format: Paper

The work contract is a core element of formal employment worldwide. It is based on some agreed-upon notion of reciprocity between tasks to be accomplished (efforts, achievements) and rewards to be provided in turn (contractual fairness). Distinct macro- and microstructural factors increase the risk that norms of contractual reciprocity are disregarded or violated by employers and managers. Macrostructural factors include an extended availability of labour force (globalized production, transnational migration, innovations in production and communication), a reduced impact of national regulations, often paralleled by shrinking power of trade unions, and a rapidly expanding private economic sector with growing influence of multinational companies. Pressures towards downsizing, restructuring or outsourcing, and rapid turnover of personnel are main microstructural factors at company or organization level.

In all these instances employee's the choices of alternative work places are reduced, and compliance with existing job arrangements may be frequent, even if they are experienced as unfair or poor. Contractual unfairness, as measured by the effort-reward imbalance (ERI) model, has been established as a risk factor of stress-related disorders (especially cardiovascular diseases and depression), sickness absence and reduced well being. The strengths and promises of the ERI model are briefly illustrated, drawing on evidence from international investigations. Finally, some limitations of the model in view of recent changes in work and employment are discussed.

Session: P1

Abstract No: 129

Author(s): Aleck Ostry

Title: Impact of Globalization on Labour Markets: Broad Implications for Research on Job Strain

Format: Paper

The myth that capital moves freely across nations is not quite true as the globalization process is really one of "Triadization" as 75 percent of all world trade takes place within three trade regions (Asian Pacific, NAFTA, EURO zone) with the rest of the world largely excluded. And with the increasingly cumbersome World Trade Organization agreements, bilateral agreements are becoming more important within these three regions. The impacts on labour markets in general and worker's job conditions in particular may be diverging across these three regions.

In general this process has increased the mobility of capital and skilled labour relative to unskilled labour. However, this process is unfolding at different speeds across these 3 main regions. I will discuss how this process has evolved in the past 20 years and how it may be leading to differential impacts on labour market dynamics, working conditions, psychosocial work conditions, and access to benefits and what this may mean for efforts to construct questionnaire instruments to evaluate the impact of these changes on the health of workers.

Author(s): Tores Theorell

Title: On the Social Dimensions in the Relationship between Psychosocial Working Conditions and Coronary Heart Disease

Format: Paper

Growing neurobiological knowledge is showing that long-lasting energy mobilization without periods of recuperation has a multitude of biological effects which increase the likelihood of "stress related" mental and somatic disorders. The list of biological mechanisms that could link these relationships is growing and relate to immunology, coagulation, lipid metabolism, regeneration and several other fields.

In many countries in the world there has been a dramatic turmoil in working life during the recent 20 years. This has affected other social arenas as well. In my own country there has been a sudden and very dramatic change during the 1990:s (more condensed than in many other countries) which started with a pronounced increase in unemployment affecting particularly low status jobs in the public sector. The societal costs (sick leave, premature retirement, unemployment benefit, social welfare) associated with these structural changes are high and pose a threat to many other societal activities. According to European Foundation (2001) surveys there has been a progressive increase in self-reported "tight deadlines" from 45% in 1990 to 54% in 1995 and to 60% in 2000. It could be argued that is only reflecting a mass media campaign "creating" a social epidemic. However, in my own country (where population surveys have had high quality for a long time) there was no change in psychological work demands during the 1970's and 1980's despite mass media beliefs to the contrary. Another pronounced change in trends in my country was that job decision latitude improved during the 1970's and 1980's, was unchanged in the early 1990's and deteriorated particularly in the public sector during the late 1990's. This latter change coincided with increasing work related mental ill health according to surveys particularly in women in the public sector among whom decision latitude deteriorated very clearly. Similar trends have been observed in other European countries. Several objective structural changes seem to explain these observations such as increased risk of unemployment, international competition with increasing insecurity and modern information technology. According to the most recent surveys the worsening seems to have leveled off during the early 2000's, however, and this also coincides with a leveling off of the development of self reported job related mental ill health.

How do these phenomena relate to the development of cardiovascular disease? That tight deadlines may trigger a myocardial infarction is illustrated by an ONSET study from our group in Stockholm (Moller et al 2005). Pronounced changes in number of staff are associated with subsequent increase in risk of hospitalization and long term sick leave according to another of our studies (Westerlund et al 2004). Women in the private sector who were exposed to marked repeated increases in number of staff at their work places in 1991-1996 had an increased incidence of cardiovascular disease in the years 1997-1999 (Westerlund et al, this conference).

A very large international case control study of first myocardial infarction patients (Rosengren et al 2004) showed that for men self-reported stress assessed after the infarction had great importance - as important as the most important accepted risk factors. Of course this may be an exaggerated finding since the study was retrospective in nature. However, other studies with more objective assessments and with prospective and quasi-prospective designs using the job strain and effort reward imbalance models show that the population attributable risk (PAR) may be in the order of 10% for both men and women below age 55 which means that improvement in working conditions could theoretically result in at least a ten-percent decrease in myocardial infarction incidence. These models do not overlap so much and this means that combining them results in improved PAR. There have also been negative findings in some studies. However, several of these negative studies have had very long follow-up periods or old subjects retiring during follow-up which make the interpretation difficult.

A large recent Danish prospective study (Prescoe et al 2004) has shown that both in men and women high scores for vital exhaustion are associated with increased myocardial infarction risk independently of other risk factors.

So why is the incidence of myocardial infarction decreasing despite deteriorating working conditions? The most important explanation seems to be that one other very important risk factor, cigarette smoking, has been decreasing during the same period. In addition, increasing knowledge in general regarding cardiovascular risk factors in Europe may have had beneficial effects.

The social class gradient in cardiovascular risk relates to the work environment questions. Can we explain away the work environment relationship by introducing social class as a confounder? Several studies have addressed this question. The response seems to be that psychosocial work environment has an independent effect on myocardial infarction risk but also that part of the social class gradient is due to differences in working conditions. Lack of control and lack of reward are more common in lower than in higher socioeconomic groups. And subjects in lower socioeconomic groups are more severely affected than others by the structural changes going on in our working life.

Working conditions have biological effects as well as effects on life style. Apart from its direct effects on risk the work arena is therefore very important in cardiovascular prevention. In many countries existing societal structures counteract integration of working life prevention with other kinds of cardiovascular prevention. A governmental committee on future public health in our country has offered interesting ways of integrating the work with psychosocial work conditions into other kinds of cardiovascular prevention.

Session: P2
Author(s): Carme Borrell
Title: Public Health Research in Barcelona
Format: Paper

Abstract No: 131

The Barcelona Public Health Agency (ASPB) is the institution responsible for public health in the city of Barcelona. Its origin lies in three centenarian organizations. In addition to its role of supporting the exercising of local health authority, its main functions are: a) to monitor the state of the population and its main determinants, b) to develop policies to improve the population's health status and , c) to guarantee the provision of services. These functions are developed in the areas of health protection and promotion, epidemiological surveillance, occupational health and care for drug addicts. The ASPB has 300 workers (Barcelona has 1,5 millions of inhabitants).

The ASPB wants to integrate the concept of "good practice" into public health through the promotion of actions based on evidence and evaluation, as well as research and training, aspiring to project, together with academic institutions, its contribution to health. Research, understood as the set of systematic processes that aim to generate new knowledge that can be generalized, constitutes a key activity of the ASPB. Research is configured as a fundamental element of support for good professional practice, through the introduction of innovations as a mediating element.

During the years 1997-2002 56 new research projects were financed and a total of 229 scientific publications were generated and published in indexed scientific journals. The lines that have published more are health problems, determinants of health and inequalities on health. Also the ASPB has a teaching and training activity (30 scholarships were trained in these 5 years).

Session: P2
Author(s): Karen Messing
Title: Francophone ergonomic analysis as a method for combating gender inequality. Karen Messing, Ana María Seifert, CINBIOSE, Université du Québec à Montréal.
Format: Paper

Abstract No: 132

Low levels of control over job parameters have been associated with cardiovascular outcomes, in Québec and elsewhere. According to the Québec Health Survey, job control has been diminishing over the last decade, and is much lower among women than men. In partnership with women's committees and health and safety committees of the three major Québec labour unions, the authors are involved in research on several aspects of the gendered organisation of work. The method used, ergonomic analysis as developed by Teiger, Laville and Wisner at the Conservatoire national des arts et métiers (Paris), used extensive observations and interviews to derive a rich representation of work activity and its determinants. The work organisation thus revealed often accentuates male-female inequalities in job control: by assigning specific tasks to women, and by lack of adaptation of job and task parameters to women's biological and social characteristics. In addition, discrimination can decrease women's control over their working lives, and widespread denial of such discrimination by both women and men makes change difficult.

Session: P2

Abstract No: 133

Author(s): David Rose, Research Professor of Sociology,

Title: The UK National Statistics Socio-economic Classification and an Illustration of its Uses in Research on Health Inequalities

Format: Paper

The UK has a tradition of using occupational data in relation to the analysis of mortality and health inequalities which dates back to 1837. Official measures of socio-economic position were first introduced from 1913 with the creation of the Registrar General's Social Classes. In this presentation I will discuss the development of the new official UK government measure of socio-economic position, the National Statistics Socio-economic Classification (NS-SEC, in use since 2001) and the reasons why it was created. The conceptual basis of the NS-SEC will be explained and its structure will be described. Finally, I shall discuss a series of NS-SEC validation studies on health inequalities using both UK death registration and other official data. These studies show not only that the NS-SEC is a good measure of socio-economic position, but that health inequalities in the UK are in some ways even more marked than had previously been supposed. The NS-SEC poses new questions for researchers interested in the social patterning of health outcomes.

Session: P2

Abstract No: 134

Author(s): Jeffrey V. Johnson, Ph.D.

Title: The Growing Imbalance: Class Inequalities in Work and Health in an Era of Flexibilization

Format: Paper

Epidemiologic studies of social class position usually conceptualize it as a category to which individuals belong. For instance, individuals in lower social class positions have markedly greater risk for CVD mortality and morbidity than do those in upper social class positions. Research has also shown that hazardous work organization exposures such as piece-rate payment systems, monotonous and repetitive work, long working hours, and low levels of work control -- factors which may also increase CVD risk -- are differentially distributed along class lines. Individuals in working class jobs -- particularly unskilled manual and lower level service occupations are much more likely to be exposed to these kinds of risk factors than those in professional and managerial jobs. Indeed, this differential work exposure across social class categories may be an important part of the explanation for the class gradient in CVD risk. Conceptually, and in reality, however, social class, is much more than just a category or a social position held by an individual -- it is a process involving a dynamic contest for power between class groups within the workplace and the larger society. For the past 25 years the relative strength of the working class in modern industrial societies has been diminishing compared to that of the employing class. This has been driven by global competition between transnational corporations and by the international and domestic political success of market fundamentalism (e.g. neo-liberalism) which has resulted in a weakening of social protections and a decline in the strength of the labor movement. Freed of the regulatory and redistributive policies of the welfare state, the modern labor process is increasingly one of flexibilization: involving the functional flexibilization of the workplace (lean production) and the numeric flexibility of the labor force (precarious employment). In addition, a polarized and segmented global architecture of production is emerging with a dwindling core of skill flexible workers and a growing number of time flexible workers who perform the more hazardous and labor intensive operations. In the United States these changes have been accompanied by an increasing polarization of income and wealth -- with the greatest gains going to the top 10% of the population. This paper discusses the importance of examining the growing class inequalities in political power, in adverse work exposure and in material well-being in order to determine whether they are serving to further exacerbate the already pronounced social class differences in cardiovascular disease.

Session: K3

Abstract No: 135

Author(s): Norito Kawakami

Title: International Comparative Research on Work and Heart Disease

Format: Paper

Objective: Psychosocial work environment, such as job strain (based on the job demands-control model) and effort-reward imbalance, has been linked with CHD; and job stress has become a major problem in occupational health among Asia, Eastern Europe, and South America, as it has been among North America and EU countries. Development of a global prevention strategy of work-related CHD requires understanding of how job stress affects CHD in diverse cultural settings. The paper reviews international variations of CHD/risk factors, job stress and the association between job stress and CHD. International variation of CHD incidence and mortality

It is well-known that the mortality from CHD is greater among US, Canada, and Europe than in Japan and China (WHO, 1993); it has increased in Eastern Europe. The incidence of CHD is also greater among these Western countries.

International variation of prevalence of job stress

Job control tended to be greater among Western countries (US, Canada, EU, particularly Scandinavian countries); job demands were similar among these countries (Karasek et al 1998; de Smet et al 2002). Work hours were longer in Korea, Singapore, Japan, US (ILO, 2001). These patterns contradict to those for CHD mortality/morbidity. Lack of reward at work was more prevalent in EU countries than in Japan and China (Tsutsumi et al 2003), although the difference is partly attributable to differential response tendencies.

International variation of job stress association with CHD and risk factors

Job strain has been associated with CHD and risk factors in Western countries (Belkic et al. 2000), although some recent studies reported null findings. Studies have demonstrated that job strain is associated with myocardial infarction, hypertension, and plasma fibrinogen in China, Korea, Japan, and Taiwan. However, there is a tendency that job demands were more associated with CHD risk factors in these countries, in contrast to previous findings from US and Europe that job control was more important. Several studies from Japan showed a positive association between work hours and CHD/risk factors; some studies in EU reported a negative association. Job demands may have a greater influence among the low job-control countries.

Conclusion:

There seems a cross-country difference in psychosocial work environment and its effects on CHD, in addition to international differences in CHD incidence/mortality, particularly between Western and Asian countries, possibly reflecting cultural/organizational/policy backgrounds among countries/regions. While the same job stress model can be applied cross-nationally, a target dimension of improvement of work-environment may be different among countries. However, data from South America and Africa, as well as immigrants, are seldom available. A worldwide collaboration should be initiated.

Session: K4

Abstract No: 136

Author(s): Robert Karasek

Title: The Stress-Disequilibrium Model of Chronic Disease Development: Low Social Control and Physiological De-regulation

Format: Paper

A new hypothesis is presented about stress-related chronic disease - the Stress-Disequilibrium Model which attempts to explain how low social control could cause chronic disease through chronic de-regulation of our highly integrated physiological systems. The talk has (I) a policy introduction, (II) an empirical and theoretical physiological core, and (III) a policy and work organization conclusion.

(I) Three claims are first made: that there is: (a) a convergence of psychosocial job characteristics observed in empirical studies across the world; (b) a convergence in the profile of work-related chronic disease in advanced societies (which are increasing); and (c) a increasing convergence of evidence for "work-relatedness" of a broad range of chronic diseases. Thus, there is likely a third explanation in the social gradient debate: one based on "absolute low social control" in our economic institutions. For this, stress theory's current explanatory paradigm (sympathetic over-arousal -> disease") is insufficient and a low control /systems de-regulation stress theory must be added.

(II) Could low external social control lead to low internal physiological control: i.e. compromised self-regulation - and then disease? Confirmation requires that a strong case be made for something called: "maximum (physiological) control capacity"- which is then limited, and thus could be overwhelmed. For this, the new core of the Stress-Disequilibrium Model is presented based on an analytic extension of the Second Law of Thermodynamics, which governs energy-into-order conversions. The extension adds a new level involving a Central Controller - i.e. central nervous system (CNS) to administer homeostatic/allostatic regulation - yielding a new thermodynamic model: Environment/ System/Controller, which fits the stress paradigm. This requires proof of one entirely new ordering capacity flow ("negative-entropy flow") to the CNS. For this, a new solution is presented ("the Neg-Entropy Pump,") to describe how order-creating capacity is created in complex organisms - and thus how it is also limited - the central claim of this theory.

Evidence from our own recent Heart Rate Variability monitoring and job strain research is presented. Several disease processes are discussed - moving from stability, to instability, to an undesirable equilibrium of chronic disease based on subsystem exhaustion and overwhelmed control capacity (i.e. the Demand/Control model is derived). Several disease pathways through autonomic deregulation are reviewed.

(III) In this way uncontrollable work organization demands of our Neo-Liberal global economy could overwhelm internal physiological control capacity, directly leading to chronic disease.

Posters

Session: Pos

Abstract No: 004

Author(s): Jian Li

Title: Effort-reward imbalance at work in association with depression in Chinese health care workers

Format: Poster

Objective: Regarding depression as a cardiovascular risk, this study was to examine the association between work stress and depression in a sample of Chinese health care workers.

Methods: A self-reported survey with standardized questionnaires was conducted in university hospitals of China, among 192 male and 608 female health care workers. The work stress was measured by Effort-Reward Imbalance (ERI) model, and depression was assessed by Center for Epidemiologic Studies-Depression Scale (CES-D).

Results: After adjustment for potential confounding factors, low reward and overcommitment were associated with an elevated odds ratio of depression, and the effects were strongest for the effort-reward imbalance ratio as predicted by ERI theory in both men and women (ORs: 1.36-2.14).

Conclusion: Findings showed supportive evidence of effort-reward imbalance associated with depression, which might contribute to development of cardiovascular diseases, in a long run.

Keywords: Effort-reward imbalance • work stress • depression • health care workers

Session: Pos

Abstract No: 009

Author(s): DuanRung Chen

Title: Health and Effort-reward Imbalance Model in a Sample of Taiwanese Medical Center Nurses

Format: Poster

Objective: This study aims to test the direct effect of imbalance and overcommitment on health and postulates that the imbalance also exerted an indirect effect through overcommitment on health.

Method: Nurses employed in 9 out of 18 medical centers had participated in this study. It results in a sample of 4098 nurses. A self-administrated questionnaire was employed. Exploratory factor analysis and structural equation model were used to model the causal path. LISERAL 8.52 was used. SF36 short form was used to measure nurses' health status. Five dimensions of SF36 were constructed, including general health, mental health, vitality, social function and body pain. Imbalance was constructed as a log-continuous variable, and overcommitment was considered a measurement model incorporated in the structural equation model.

Result: Different structural equation models all confirm that imbalance and overcommitment has direct effect on nurses' health, and also generates an indirect effect through overcommitment on all five dimensions of health measured by SF36 short form. For these five models of health, the RMSEA ranges from 0.08 to 0.09; GFI ranges from 0.96 to 0.97, and AGFI ranges from 0.93 to 0.94. Imbalance generates a direct negative effect (standardized estimates) on health, the effect ranges from -0.04 (mental health), -0.07 (general health), -0.11(social function), -0.14 (body pain), and -0.17 (vitality). Imbalance also exerts an indirect effect through overcommitment on health, the indirect effect ranges from -0.39(mental health), -0.25(general health), -0.29(social function), -0.19(body pain), -0.44(vitality). The result generates a total effect of imbalance on health, ranging from -0.41(mental health), -0.32(general health), -0.4(social function), -0.33(body pain), -0.63(vitality). Overcommitment also generates a direct negative effect on health, the effect ranges from -0.69 (mental health), -0.45 (general health), -0.50(social function), -0.33 (body pain), and -0.79(vitality). The results show that, in general, overcommitment has a stronger effect on health than imbalance. An example of general health is in the last part of this abstract.

Conclusion: Imbalance does have an adverse effect on health, yet the effect is aggravated by the personality variable, overcommitment. The result shows that stress copying behavioral pattern at individual level does play an important role in mediating the effect of work environment on health.

Session: Pos

Abstract No: 012

Author(s): Jeffrey M. Conte, Stephanie Strauss, Patricia Duarte, & Nichole Best

Title: An examination of validity and group differences in Type A subcomponent predictors of health outcomes

Format: Poster

Researchers have attempted to identify the factors that result in work stress and subsequent strain. At the same time, the workforce is becoming increasingly diverse with regard to both gender and ethnic background, and it is important for researchers to directly examine the factors that affect the health and well-being of individuals from various demographic groups. However, occupational stress researchers have not focused a great deal of attention on these workforce changes nor have they fully investigated subcomponents of the Type A behavior pattern that have shown recent promise in predicting health and performance outcomes.

This study investigated Type A behavior pattern subcomponent predictors of health outcomes (i.e., burnout, depression, headaches, digestion problems) in a demographically heterogeneous sample. Type A behavior pattern (TABP) subcomponents included in this study were Achievement Striving, Impatience/Irritability, and several Time Urgency dimensions such as Time Awareness, List Making, Eating Behavior, Scheduling, Deadline Control, Task-Related Hurry, and General Hurry. Participants were 307 undergraduate psychology students (29% male, 71% female) who completed a survey to obtain credits for a research participation requirement for an introductory psychology course. Participants ranged in age from 17 to 36 (mean = 18.9, sd = 1.8) and were of varying ethnic backgrounds. Specifically, 173 Caucasians, 52 Hispanics, 13 African-Americans, and 40 Asians participated in the survey.

Across the entire sample, several TABP subcomponents (e.g., Impatience/Irritability, Task-Related Hurry) were significantly related to a variety of health outcomes. In terms of comparisons between ethnic groups, Caucasians were significantly higher on impatience/irritability (II) than Hispanics. There were no other significant differences between Caucasians and Hispanics on any of the predictors or criteria. Caucasians and African-Americans did not significantly differ on any predictors or criteria. In terms of gender comparisons, males were significantly higher than females on Eating Behavior, Burnout, and Hostility, whereas females were significantly higher than males on Time Awareness, List Making, Headaches, Digestion Problems, and Family Social Support. Applied implications and future research directions in this area are discussed.

Session: Pos

Abstract No: 018

Author(s): Dumitru Zrenghea, Laura Poanta, Dan Gaita

Title: Cardiovascular Risk Factors and Risk Behaviors in Railway Workers

Format: Poster

The research considers the hypothesis that stressful professions, such as engine driver, influence the morbidity and mortality through cardiovascular diseases and favour some harmful habits with an impact upon cardiovascular morbidity.

Methods: There were selected for the study 496 engine drivers, males, and a control group of 305 males. They were questioned about: name, address, family history, pathological personal history, alcohol intake, smoking, diet habits, physical activity, sleeping hours and stress perception. There were measured: height, weight, blood pressure. There were determined: fasting plasma glucose, cholesterol, triglycerides, HDL-cholesterol and LDL-cholesterol.

Results: Hypertension was registered in 23.5% of the engine drivers and in only 9.5% for the control group ($P < 0.05$). Dyslipidaemia was noted in 57.4% of the engine drivers and 52.45% of the control group. Prevalence of smoking and overweight was higher in control group ($P < 0.05$), but the prevalence of subjects smoking only on their workplace was higher for engine drivers. Unhealthy dietary patterns and physical inactivity were present in both group, the circadian rhythms were altered only for engine drivers and questionnaires for stress perception showed higher irritability in control group.

Conclusions: The prevalence of some risk factors is higher for engine drivers but for the others is not. Also it seems that professional stress favours some harmful habits such as tobacco smoking, but the control group smokes more and they are inactive individuals with a great amount of irritability among them. The results do not totally sustain the idea we started from, that engine driver is perceived like a stressful profession; it seems that a demanding job does not necessarily imply "harmful stress".

Session: Pos

Abstract No: 019

Author(s): George Bakhturidze, Gela Kobeshavidze

Title: Tobacco Consumption, environmental smoking and heart diseases in Georgia

Format: Poster

The essence of the problem: Tobacco consumption in Georgia has increased to alarming proportions since 1990, owing mostly to the transition toward a market economy and the arrival of the international tobacco industry whose costly promotional campaigns for their products have thrived in the absence of legislative regulations.

The research addressed in the study of epidemiology of tobacco production consumption during of last 5 years and correlation with increasing of tobacco related diseases.

Methods: Survey population: population in the age range 10-74: 2382 in total. Quantitative research structured interviews. For choosing of population was used cluster method. A group of interviews was used for this purpose, their training and selection were conducted. Geographic coverage: all Georgia.

Results: There was researched population from 10 to 74 years old. These researches have shown that in Georgia smoking rate is nearly 52,1% in men and 14,7% in women population.

In 1998-99 years in Georgia consumed tobacco 1.700.000 persons, among them 1.200.000 men and 500.000 women. It is 37% of our population. In comparison with the 1985 the number of smokers among youth and among young women increased 3 times.

105.000 - heart diseases. In year 1998 in Georgia 8.000 people died because of smoking, and additional 2 500 from environmental smoking, which is 21% of total mortality.

Conclusion: We've very hard situation in consumption of tobacco in population of Georgia, mainly with in young population. We've no legal regulations of many of fields of tobacco control questions. Poor population has no possibility to receive treating of tobacco dependence free.

Recommendations

Adopting new changes in national law on Tobacco Control; ratification of the FCTC and realization of recommendations of WHO and working group of FCTC; Government must to establishment of new taxes for health interests and financing multi-sector programs in Tobacco Control.

Session: Pos

Abstract No: 025

Author(s): Estela Regina Ferraz Bianchi

Title: Stress and coping among cardiovascular nurses in São Paulo-Brazil

Format: Poster

Cardiovascular nurses are frequently involved in critical patient care, providing support to patients and their families. The goal of this study were to survey a representative sample of cardiovascular nurses, describe ways of coping, and identify sources of stress in the hospital setting. A self-completed questionnaire was distributed to 76 nurses from a cardiovascular hospital in São Paulo City, Brazil. The measures were the Nursing Stress Evaluation Questionnaire (NSEQ) by Bianchi and Ways of Coping Questionnaire (WCOQ) by Folkman and Lazarus. A high response rate of 76.3% was achieved. The results identified work conditions as the major source of stress for nurses and use of positive reappraisal, self-controlling skills, and social support to cope with job stress. Nurses are using coping strategies based on personal resources but the use of organizational strategies is encouraged to improve life quality.

Author(s): Luz Amparo Pérez and Viviola Gómez Ortiz

Title: Psychosocial Work Related Factors, Stress and Acute Myocardial Infarct in Colombian Working People

Format: Poster

The purpose of the study was to evaluate if the psychosocial conditions considered in the Siegrist's effort-reward model (1996) and the fact of being working or not in the dependent labor force, discriminated between two groups of workers who had suffered or not Acute myocardial infarct (AMI). It was also researched whether work centrality and work- family spillover moderated the effect of the variables under study.

The research included 117 people (M=104, F=13; AMI diagnosis= 55 not-AMI diagnosis=62; Mean Age = 50Y, SD= 7.53). Scales used were the ERI-Effort Reward Imbalance (psychosocial work related factors, Siegrist, 1996); the Work-Family Spillover (Grywacz & Marks, 2000) and the Work Centrality (Whitley & England, 1977). A series of dichotomous logistic regression analysis was performed (variables entered in blocks). The AMI group was the reference group and the non-AMI was the comparison group. Two models were estimated in the logistic analyses of the moderating effects: with or without interaction terms. If the Chi square change between the two models was statistically significant, then the model estimated with interaction terms would be considered a moderator.

It was found that the combination of extrinsic and intrinsic components of the ERI model is able to discriminate between the AMI and non-AMI groups. The B exponent in the effort-reward ratio was interpreted as that the working person belonging to the high-risk group has eight times as much probability of suffering AMI, as compared to any other person belonging to the low/no-risk group. The intrinsic effort B exponent indicates that for each unit increase in this variable, the probability of suffering AMI increased 1.25 times more. The effort-reward ratio shows having a greater weight in discriminating between the AMI and non-AMI groups, as compared to intrinsic effort. In the goodness of fit test of the model as a whole, the chi square = 33.92 ((gl = 3, p = .001) indicates the statistical significance of the estimated logistic regression model.

The results of the logistical analyses point out that, independently, none of the components of the effort-reward imbalance model are statistically significant. However, jointly, these variables discriminate the fact of belonging to the AMI group. The moderating effect of Work Centrality and of Positive/Negative Work-family Spillover was not supported. The study highlights the discriminant ability of the psychosocial work-related factors with respect to a person's belonging, or not, in the AMI group. It also confirms the validity of the model of Siegrist (1996) in a non-European context.

Session: Pos

Abstract No: 032

Author(s): E. Gadzicka, A. Bortkiewicz, M. Zmyslony, W. Szymczak

Title: Circadian variation of arterial blood pressure in operators of radio and tv stations

Format: Poster

The operators of radio and TV stations are exposed to different electromagnetic fields (EMF) levels, depending on various factors such as transmitter technological characteristics, feeder quality, distance from the antenna, etc.. Very wide spectrum EMF, ranging from several hundred kHz to several GHz, are used for that purpose. As the number of people exposed to such fields increases, there has been a growing interest in the health effects or possible health hazards from exposure to those fields. The results of experimental studies suggest that exposure to radio frequency EMF may cause an increase in arterial blood pressure or its decrease after exposure cessation. However, clinical studies on workers occupationally exposed to this EMF range have not been performed.

The aim of our study was to assess the circadian variation of arterial blood pressure (BP) in workers exposed to radio-frequency electromagnetic fields (RF EMF). The groups under study consisted of technical personnel who were qualified by the occupational health practitioners as capable to work at permissible EMF levels. The study comprised 71 workers of radio or TV broadcasting stations, aged 45±9 yr., exposure duration 19±9 yr. The controls were 42 subjects, aged 49±8 yr., employment duration 13±4 yr. The workers of the control group are free from being exposed. All participants had performed medical examinations, office BP measurement and 24-h BP monitoring (ABP).

Mean 24h (BPSO, BPDO), daytime (BPSD, BPDD) and nighttime (BPSN, BPDN) systolic and diastolic blood pressure and day/night BP ratio were determined. The statistical analysis comprised one-way analysis of variance, covariance analysis and logistic regression models. BPSO, BPSD and BPSN were significantly higher in the exposed group than in controls. The percentage of people with elevated BP in the exposed group was also significantly higher (p=0.0011). The odds ratio of elevated BP in the exposed group was 8.6. It is worth noting that 53% of subjects with normal BP determined by office measurement showed elevated blood pressure values in ABP monitoring. The proportion of subjects without the nocturnal drop of systolic and/or diastolic BP was significantly higher (p=0.008) in the exposed group. We concluded that in workers exposed to RF EMF, the blood pressure regulation is impaired. Therefore, it would be necessary to incorporate 24-h ABP monitoring in the scope of prophylactic examinations for workers occupationally exposed to radiofrequency EMF.

Author(s): J. Siedlecka, A. Bortkiewicz, E. Gadzicka

Title: Work-related stress and arterial hypertension in public transport drivers

Format: Poster

The job of a bus driver in public transport is associated with a high level of stress at work, mostly due to being responsible for the safety of passengers in heavy urban traffic. Therefore, this profession is characterized by an increased risk of cardiovascular diseases, including hypertension. The traffic collisions he may take part in, as well as the time pressure, or the possible conflicts with passengers, may cause a sudden increase in arterial blood pressure, which potentiates the risk of an accident. The clinical practice shows that an individually-adjusted hypotensive treatment allows the patient to lead a fairly normal life. However, there are no literature reports on the tolerance of occupational activity and the cardiovascular function in such patients. Accordingly, the present project has been focused on investigating the cardiovascular response to professional duties and work-related stress in public transport drivers with treated and untreated arterial hypertension vs. the drivers with normal blood pressure values.

The study group were 61 drivers aged 37-58 years. Thirty of them had a hypertensive disease: 15 subjects received systematic treatment and the other 15 had no hypotensive therapy. Normal BP values were found in 31 subjects. All the subjects had general medical examination, responded to a questionnaire regarding the risk factors and symptoms of hypertensive disease, had 24-h heart rate and blood pressure monitoring. The subjects were asked to record in writing all the stressful situations at work while the monitoring of the hemodynamic functions was proceeding. Seventy-five conditions with different level of stressogenicity were identified and appropriate BP and HR values from the monitoring records were assigned. The statistical methods included analysis of variance and logistic regression model.

The results revealed that in subjects with untreated arterial hypertension, the cardiovascular response to stressogenic conditions consisted in a higher increase in systolic BP (180/113 mm Hg) than in those with normal BP (144/94 mm Hg) or receiving hypotensive treatment (153/101 mm Hg); ($p < 0.01$) This finding points to a high significance of the hypotensive therapy which, when combined with a healthy lifestyle, ensures a better tolerance of stressogenic conditions of the bus driver's job. The outcomes of the study indicate a necessity for undertaking preventive activities to reduce the level of stress, e.g. training in stress coping and conflict solving strategies and for a periodical long-term monitoring of arterial blood pressure in the workers at risk.

Session: Pos

Abstract No: 037

Author(s): Almira Kustubayeva, Janna Bideldinova, Genadi Kutcov

Title: The estimation cardiovascular disease risk under in plant environment impact

Format: Poster

Background and purpose: Cardiovascular disease (CVD) remains the largest contributor to morbidity and mortality in the Eastern Kazakhstan which became a special ecological disaster's area because of the intensive development of non-ferrous metallurgy. For estimation of in plant environmental impact as CVD risk factors we studied the heart rate variability (HRV) in metallurgical plant's workers and children living in the neighboring territory.

Methods: We used variable pulsometry (VP) method (R.M. Baevskii, 1979) with the "rhythmocardiograph". The study involved nondiseased 250 workers from 18 to 60 years old (18-30; 31-44; 45-60 age-matched groups) with different seniority levels (1- 5, 6-10, 11-20, 21- 30 years in every age-matched group). The study also involved 45 healthy children from 6 to 15 years old who lived neighboring territory. In addition, the anxiety level was measured by Spielberg's State-Trait Anxiety Inventory. The data were analyzed using statistical analysis software (version 11, SPSS).

Results: Age-specific differences of the VP parameters (Mo- mode, AMo- Model's amplitude, ΔX -variable range, SI - stress index, VBI – vegetative balance index and others) were observed in children and adults. The specific HRV changes depending on seniority were ascertained in every workers age-matched group. The sympathetic nervous system influences were increased and, on the contrary, parasympathetic activity was decreased gradually with rise in seniority. It's known that sympathetic hyperactivity is one of the earliest indicators in the developing CVD (A. Malliani et al, 1991 and others). Furthermore, significantly greater SI was found in subjects with greater seniority. According to R.M. Baevskii's theory the parameter SI determinates the adaptation level. The parameters SI in workers with seniority from 6 to 10 years have showed "tension of adaptation mechanism", from 11 to 20 years – "unsatisfied adaptation", over 20 years – "adaptation derangement". The VP parameters in children living in the neighboring territory were compared to the control group. These data supports our hypothesis of environmental impact on HRV of growing body. The parameters SI of children were evidence of "tension of adaptation mechanism". Moreover, the parameter SI was correlated with anxiety level.

Conclusions: The long-term working conditions impact on HRV with the gradual involvement of regulatory mechanisms changing. The pollution also influences on children HRV. The variable pulsometry is a reliable approach for estimation CVD risk and prenosological diagnostics CVD.

Key words: working conditions impact, heart rate variability, stress, anxiety.

Session: Pos

Abstract No: 044

Author(s): Himanshu Kumar, Mekala Arunachalam, V. Ramamoorthy, V.N.Sharma, P. Thirumalaikolundusubramanian

Title: Various risk factors for cardiovascular diseases among hypertensives of a public sector industry unit, India

Format: Poster

Background: Affluence enhances the risk factors for cardio vascular disease (CVD). To confirm or refute this observation, the present study was undertaken.

Objective: To identify various risk factors for cardiovascular diseases among well paid permanent employees with hypertension.

Methodology: A total of newly detected 481 hypertensive patients of an industrial unit at Tamilnadu were evaluated to find out the various risk factors for cardiovascular diseases. The data were analyzed.

Results: There were 267 males and 214 females with median age of 49.5(Standard Deviation – 11.9) and 41.1 (Standard Deviation – 11.8) respectively. The risk factors were – family history of Coronary Heart Disease in 53.6%, Non-vegetarian consumption in 84.2% with elevated blood cholesterol in 38.5%. Smoking and alcoholism were prevalent among 92.2% & 92.7% of males only respectively. None of the females were Smoker and alcoholic. The BMI of male and female were 25.4 and 26.7 respectively and Waist/Hip ratios were 0.9 and 0.9 respectively. 39.7% male and 54.2% female had diabetes. These all risk factors for CVD were significantly high in this population.

Conclusion: These affluent industrial workers had multiple risk factors for coronary Artery Disease. They are not willing to adopt a healthy life style. Moreover their socioeconomic and cultural aspects permit them to adopt this lifestyle, which predisposes to multiple risk factors for cardiovascular diseases.

Key Words: - Hypertension, Industrial environment, India

Session: Pos

Abstract No: 047

Author(s): A. Bortkiewicz, E. Gadzicka, M. Zmyslony

Title: Heart rate variability analysis in workers exposed to radio frequency electromagnetic fields (EMF)

Format: Poster

The data on cardiovascular changes connected with exposure to radio frequency EMF are ambiguous. Some studies indicated that in the exposed people such symptoms develop as heart rhythm disturbances, impaired conduction, decreased amplitude of ECG records and blood pressure changes (hypo- or hypertension) The observed changes may be due to the disturbed neurovegetative control of the circulatory system.

The aim of the study was to explain the mechanism of cardiovascular impairments in workers exposed to UHF-VHF radio frequency EMF. For this study, the heart rate variability analysis (HRV) was performed as it allows monitoring the sympathetic and parasympathetic activity of the autonomic nervous system. Heart rate variability (HRV) was analysed basing on 512 normal heart beats registered at rest. The analysis concerned time- domain (AVG R-R, STD R-R) and frequency-domain parameters of HRV calculated using FFT method. The power spectrum density (area covered by the power spectrum) was computed for the following frequency bands: very low (VLF): 0.0167 - 0.05 Hz; low (LF): 0.05 - 0.15 Hz, high (HF): 0.15 - 0.35 Hz and expressed as a percent of spectrum power in the range 0.0-2.5 Hz.

The groups under study consisted of technical personnel and security service workers from 4 radio-and TV broadcasting stations: 59 workers (group I) with low- and 12 workers with high exposure level (group II). Mean age were 47±9 yr and 41±14 yr, mean exposure duration 19.1±8.8 yr and 13±4 yr respectively The controls were 42 non- exposed subjects, aged 49*8 yr. The statistical analysis comprised one-way analysis of variance, covariance analysis and logistic regression models. In exposed groups heart rate was higher than in controls. STD R-R was found to be significantly ($p=0.0285$) lower in group I (42.5 ± 24.7 ms) than in the controls (62.9 ± 53.5 ms). In the EMF-exposed group, the proportion of subjects with decreased HRV (STD R-R <27 ms) was twice as high as in the controls. The risk of lowered HRV increased significantly (OR=2.37, $p.=0.023$) in group II. In both the exposed groups, the VLF and LF was found to be significantly higher than in the controls ($p=0.005$ and $p.=0.0025$, respectively). The EMF exposed groups were characterised by the dominance of the sympathetic system. LF/HF ratio was significantly higher ($p=0.0016$) in the exposed group (1.3 ± 0.35 vs. 0.95 ± 0.20).The percentage of subjects with dominant sympathetic activity amounted to 58% in group II and 19% in the control group

Our results indicate that the exposure to radiofrequency EMF could influence the neurovegetative regulation.

Session: Pos

Abstract No: 052

Author(s): Jeffrey M. Conte, Stephanie Strauss, Patricia Duarte, & Nichole Best

Title: An examination of validity and group differences in Type A subcomponent predictors of health outcomes

Format: Poster

Researchers have attempted to identify the factors that result in work stress and subsequent strain. At the same time, the workforce is becoming increasingly diverse with regard to both gender and ethnic background, and it is important for researchers to directly examine the factors that affect the health and well-being of individuals from various demographic groups. However, occupational stress researchers have not focused a great deal of attention on these workforce changes nor have they fully investigated subcomponents of the Type A behavior pattern that have shown recent promise in predicting health and performance outcomes.

This study investigated Type A behavior pattern subcomponent predictors of health outcomes (i.e., burnout, depression, headaches, digestion problems) in a demographically heterogeneous sample. Type A behavior pattern (TABP) subcomponents included in this study were Achievement Striving, Impatience/Irritability, and several Time Urgency dimensions such as Time Awareness, List Making, Eating Behavior, Scheduling, Deadline Control, Task-Related Hurry, and General Hurry. Participants were 307 undergraduate psychology students (29% male, 71% female) who completed a survey to obtain credits for a research participation requirement for an introductory psychology course. Participants ranged in age from 17 to 36 (mean = 18.9, sd = 1.8) and were of varying ethnic backgrounds. Specifically, 173 Caucasians, 52 Hispanics, 13 African-Americans, and 40 Asians participated in the survey.

Across the entire sample, several TABP subcomponents (e.g., Impatience/Irritability, Task-Related Hurry) were significantly related to a variety of health outcomes. In terms of comparisons between ethnic groups, Caucasians were significantly higher on impatience/irritability (II) than Hispanics. There were no other significant differences between Caucasians and Hispanics on any of the predictors or criteria. Caucasians and African-Americans did not significantly differ on any predictors or criteria. In terms of gender comparisons, males were significantly higher than females on Eating Behavior, Burnout, and Hostility, whereas females were significantly higher than males on Time Awareness, List Making, Headaches, Digestion Problems, and Family Social Support.

Applied implications and future research directions in this area are discussed.

Session: Pos

Abstract No: 056

Author(s): Leslie A. MacDonald, Sc.D. and Joseph J. Hurrell, Ph.D.

Title: Organization of Work Measurement Tools for Research and Practice: Development of a Measures Catalog

Format: Poster

The organization of work has been identified as one of the nation's leading research priorities under the National Occupational Research Agenda (NORA) and is a central area of focus in occupational cardiovascular disease epidemiology. Because methodological development for organization of work assessments span across many disparate fields of study, no efficient process exists to identify organizational assessment tools or instruments for use in surveillance, epidemiologic research, and practice. To enhance research on the effects of the organization of work, a catalog of organization of work measurement tools and instruments (Measures Catalog) is under development at the National Institute for Occupational Safety and Health (NIOSH). This poster identifies the planned content areas of the Measures Catalog, procedures for nominating tools and instruments for inclusion, and dissemination plans.

Because the organization of work encompasses the work process and the organizational practices that influence job design, content areas targeted for inclusion in the Measures Catalog include management structures, supervisory practices, production methods, human resource policies, as well as job and task characteristics. Instruments or tools are sought that represent a broad range of methodologic approaches, including self-administered questionnaires, structured interviews, checklists (including benchmarking tools), diaries, observational rating systems, and others. Measures for single and multi-dimensional constructs or dimensions are suitable for inclusion, as well as measures that are generic and industry- or occupation-specific. Classification systems, such as the Dictionary of Occupational Titles, containing occupation or sector level characteristics that may be applicable in health research, will also be included.

Developers and users of organization of work instruments are encouraged to nominate measures for inclusion in the Catalog. The nomination process requires knowledge of basic descriptive information about the instrument and how it can be accessed by prospective users. Nomination information will be verified to ensure that: 1) newly nominated instruments are not redundant with instruments previously included or nominated, 2) the nominated instruments exist and the information provided for accessing the instrument is accurate, and 3) nominated instruments contain measures encompassing the content areas noted above. The Catalog of Measures is under development as a NIOSH numbered publication and, as such, is expected to become available as a hard copy publication available from the NIOSH Publication's Office and as an electronic (PDF) file accessible through the NIOSH web site.

Session: Pos

Abstract No: 074

Author(s): Chien-Tien Su, MD, MPH

Title: Association Between Work Stress Status and Cardiovascular Risk in a Population of Taiwanese White-Collar Workers

Format: Poster

Using data from a survey of a white-collar working population in Taiwan (438 women, 526 men), the relation between work stress and cardiovascular risk factors (high serum total cholesterol, low serum high-density lipoprotein (HDL) cholesterol, and high plasma fibrinogen) was examined. Work stress indicators, developed by the Institute of Occupational Safety and Health in Taiwan, included stressor frequency and stressor perception each with 4 factors from job type, organizational culture, career goal, and work support. Blood pressure, cholesterol and fibrinogen were analyzed as continuous variables, whereas the stressor frequency and stressor perception were each dichotomized into 2 levels and work stress into 4 exposure categories.

Plasma fibrinogen was significantly and positively associated with work stress status in both male and female workers and also with stressor perception in female workers only. No consistent association between job strain status and total serum and HDL cholesterol was detectable. In conclusion, plasma fibrinogen is a possible intermediate factor linking occupational stress to elevated cardiovascular risk.

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Session: Pos

Abstract No: 076

Author(s): Mostafa Ghaffari, Mohsen Naghavi

Title: Pattern of Cardiovascular Death in IRAN

Format: Poster

Like other developing countries, Iran is undergoing epidemiological transition, which is characterized by many changes in terms of morbidity and mortality patterns. Cardiovascular disease is one of the leading causes of death worldwide and responsible for 45 % of death in the western world and 24.5 % of death in developing countries. In recent years developing countries have seen an increasing frequency in CVD mortality and affected labour market.

Here we report all cause and CVD mortality rates for men and women aged 15-49, more than 50 years, and all ages in 10 provinces in Iran with more than 16 million inhabitants.

The study was based on death records using the tenth international classification of diseases. Data gathered from different resources in all rural and urban areas. Results shows that in 2000 in ten province of Iran 23256 inhabitants died due to CVD and 223028 years of life lost. Around 35% of all cause of death and 22.8% of standard expected years of life lost was due to CVD.

Data indicate that CVD remains a serious public health problem. It suggest the ongoing need for more regular and systematic surveillance data.

Session: Pos Abstract No: 077

Author(s): Mostafa Ghaffari, Akbar Alipour

Title: Sickness absence due to Cardiovascular diseases Among Industrial workers in IRAN

Format: Poster

Sickness absence data is increasingly being used as an integrated measure of health in the working population. The use of sick leave as a measure of morbidity has been discussed, since sickness absence is multi-factorial and influenced not only by the individual health status, but also by the work environment, psychosocial factors and social insurance system. The influence of work satisfaction is an important factor along with health status. The range of health disorders among industrial workers, which result in absence from work, is well documented, and disorders of the circulatory system are the third most common cause for disability pension.

The study performed in one of the biggest industrial group in Iran with more than 18000 employees. A database was created that included all new sick leave spells during 2003. Demographic data concerning age, gender, occupation, and the diagnosis stated on the sickness absence certificate were recorded for each sick-leave spell.

In total 77 new episode of sickness absence due to cardiovascular diseases and 1996 sick-leave days during one year reported. Cumulative incidence for sickness absence due to CVD was 0.4 % and duration of absence was 26 days.

Our finding reinforce for the importance of sickness absence surveillance as an integrated measure of health in the working population as well as occupational health policy and planning for reducing the CVD risk factors at work environment.

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Session: Pos

Abstract No: 080

Author(s): Mostafa Ghaffari, Akbar Alipour

Title: Prevalence of Ischemic Heart Diseases and Hypertension among Industrial workers in iran

Format: Poster

Objectives: To determine the prevalence of Ischemic Heart diseases (IHD) and hypertension in Iranian industrial workers and how it varies with demographic factors, job title, and gender.

Background: Studies on the prevalence of IHD and hypertension and its association with occupational and individual factors are reported from developed countries. Studies from developing countries are few.

Methods: Study design. Cross-sectional study. In 2000, all 11555 employees from the largest Industrial group in Iran were investigated and 75.5 % responded. The prevalence of IHD and hypertension were recorded with physical examination and medical history during annual checkups. Demographic data and lifestyle factors (age, sex, education, weight, work experience, smoking, fitness training) were also collected.

Results: The prevalence of IHD in the Iranian industrial population was 6 in 1000 employees, and prevalence of hypertension among them was 11 in 1000 employees. The majority of this study population are young males (under 30) and a small proportion of the work force is female (4%).

Conclusions: Heart disease is common among industrial workers in the developing country studied and needs more studies about occupational risk factors for cardiovascular diseases.

Author(s): Beauregard, N., Lemyre, L., Corneil, W., Barrette, J., Legault, L.

Title: A multilevel analysis of the occupational stress determinants among Canadian public service executives

Format: Poster

Objectives: The role of organizational context as an determinant which distinctively shapes the occupational stress process has been widely overlooked. This study aims at disentangling the respective contributions of organizational and individual pathways to occupational health.

Design: Data was derived from a national survey of 1157 senior executives working in 63 departments and agencies of the Canadian Federal Public Service. Multilevel statistical analyses in which executives (level 1) were nested within their respective departments (level 2) were performed to assess the contribution of contextual and compositional explanations on executives' psychological stress.

Measurements: Validated self-administered questionnaires relied on the NIOSH battery for assessment of the work stressors (workload, social support at work, decision latitude, intrinsic and extrinsic rewards), and a composite scale evaluating work protective learning resources. Psychological stress was measured with PSM49 (Lemyre et al., 1993).

Results: Significant variance found across departments supported the presence of contextual origins to executives' psychological stress, above and beyond executives' compositional attributes. Further, psychosocial work indicators contributed to explain significantly more residual variance than sociodemographic characteristics altogether.

Conclusion: These results demonstrate the necessity of better understanding and evaluating larger contextual, organizational factors on the stress process.

* With the financial contribution of the Social Sciences and Humanities Research Council of Canada(SSRCH), Institut de recherche Robert Sauvé en santé et sécurité au travail (IRSST) and University of Ottawa.

Session: Pos

Abstract No: 087

Author(s): Tania Araujo, Diva Lima, Juarez Carmo Jr., Marcia Viana, Clébia Santos

Title: JOB STRAIN AND ARTERIAL HYPERTENSION AMONG WOMEN

Format: Poster

Background: Arterial hypertension is a frequent disease in the Brazilian population, and the main cause for early retirement, medical compensation and work absenteeism, with heavy social and economic costs.

Objective: To investigate the association between job strain and arterial hypertension among women employed in a Brazilian University. Methods: A cross-sectional study was carried out among all 564 women employed in the State University of Feira de Santana, Bahia, Brazil. We studied 475 women (response rate: 84.2%). The Job Content Questionnaire (JCQ) was used to evaluate job strain.

Results: The age mean was 38.8 ± 10.4 years. High coworker support was higher in Low Strain job (41.9%) e Active job (36.1%) than in High Strain job (13.2%) ($p=0.001$). High Strain job was more frequent among women with ≤ 5 years in this profession (45.7%) against only 9.8% among women with ≥ 15 years ($p=0.017$). In High Strain job we observed higher percentage of physical effort (69.6%) and rapid and continuous physical activity (63%) than in Low Strain job (13.8% and 26.5%, respectively; $p<0.05$). Physical effort decreased with time in this work ($p=0.01$). Arterial hypertension (AH) prevalence rate was 15.3%. AH prevalence was higher among women whose jobs required physical effort. AH was lower in high supervisor support (11.1%) than in low support (20.4%); $p=0.02$). Arterial hypertension prevalence was higher in High Strain job (18.4%) than in Active job (13.4%) and Low Strain job (14,0%). The AH prevalence in Passive job was 15.3%.

Conclusion: High Strain, as evaluated by Job Content Questionnaire, was associated to arterial hypertension prevalence. These findings suggest that redesigning the job organization is necessary, aiming to increase decision latitude and to decrease psychological demands at work.

Session: Pos

Abstract No: 088

Author(s): Julizar Dantas, Rene Mendes, Tania Araujo

Title: ASSOCIATION BETWEEN PSYCHOSOCIAL JOB CHARACTERISTICS AND ARTERIAL HYPERTENSION IN AN OIL REFINERY IN BRAZIL

Format: Poster

Productivity restructuring repercussions on work organization are related to labor burden and to worker's strain, what may determine new forms of disease. This study aimed to investigate the association between some job psychosocial characteristics, based on the Job Strain Model, and the prevalence of arterial hypertension among workers in an oil refinery in the State of Minas Gerais, Brazil.

A case-control study design comprised 229 workers (65 hypertensive and 164 normal blood pressure workers). The associations between arterial blood pressure and job strain and working hours were explored. The Job Content Questionnaire was used to measure job strain.

The results of this study revealed no association between high strain and arterial hypertension. However, this study showed that social support was higher in low strain and active jobs as compared to high strain jobs ($p<0.001$). Further the risk of losing one's job was associated to high strain job ($p< 0.001$). This study failed to find any association between: a) high strain job and smoking/consumption of alcoholic beverages; b) long journeys and hypertension; c) shift work and hypertension, consumption of alcoholic beverages or smoking. Although this study did find association between psychosocial factors and arterial hypertension, there is some evidence that high strain job may determine other forms of disease. High strain jobs concentrated higher working risk situations than the other types of jobs.

We concluded that health promotion at work should include efforts to reduce workload and worker's strain, by using more flexible schemes of work organization (improvement of decision latitude; intelligent use of worker's skills and creativity, and regulation of working demands), reduction of job insecurity and improvement of social support, provided by both management and workers.

Session: Pos

Abstract No: 089

Author(s): P. Landsbergis (1), M. Adamu (1), P. Schnall (2)

Title: Trends in U.S. job characteristics, 1977 - 2002

Format: Poster

Between 1969-1977, three surveys were conducted by the U.S. Department of Labor, known as the Quality of Employment Survey (QES). Beginning in 1992 and every 5 years after that, the Families and Work Institute conducted a survey called the National Study of the Changing Workforce (NSCW). All the surveys from 1969 to 2002 were conducted to study the work characteristics and personal lives of the U.S. workforce. Although different methods and questionnaire items were used in the surveys, some of the surveys were very comparable.

We examined data from the 1977 QES and 1997 and 2002 NSCW to assess trends in job characteristics in the U.S. workforce. Sample sizes are large enough to support analyses of many subgroups of interest: 1977 total sample = 1,515 (1,298 wage and salaried workers); 1997 total sample = 3,552 (2,877 wage and salaried workers); 2002 total sample = 3,504 (2,810 wage and salaried workers). Among eligible households, the overall response rate for 1997 and 2002 were both slightly greater than 52% and the response rate for the 1977 survey was about 73%. Samples from the 1977 survey included individuals who were at least 16 years of age and working at least 20 hours per week. However, the 1997 and 2002 survey included subjects who were at least 18 years old. In this analysis and for comparative purpose, only samples who were at least 18 years of age and are wage and salaried employees were studied.

The results from the three surveys show that the percentage of women in the workforce has been increasing, from 38% (1977) to 58% (2002). It was also observed that there were more older people in the workforce today than 25 years ago. In addition, people in the workforce today achieved increasingly higher education levels. The proportion with post-secondary education or a 4-yr college degree or more increased from 44% in 1977 to 72% in 2002. This trend was much greater in women compared to men. Level of education was also strongly associated with occupation. People with higher education tend to hold managerial or professional positions compared to individuals who have less than a high school education. About 66%, 54%, and 57% of workforce are also married or have household partners in 1977, 1997, and 2002, respectively. We will present trends between 1977-2002 for job characteristics such as job demands, job autonomy, learning opportunities, and work social support, for the whole sample, and for subgroups defined by socioeconomic status, age and gender.

Session: Pos

Abstract No: 090

Author(s): Diva Lima, Tania Araujo, Amanda Rabelo, Millena Santos Silva

Title: CORONARY HEART DISEASE (CHD) RISK FACTORS AMONG WOMEN EMPLOYEES IN A BRAZILIAN UNIVERSITY

Format: Poster

Introduction: Cardiovascular diseases are the main death cause among men and women, in developed and developing countries. However, only a small number of studies evaluated coronary disease among female populations. Most of the existent researches were developed in male populations and their results inferred to women. The validity of this inference is still questionable.

Aim: To describe the prevalence of risk factors to arterial coronary disease among women working in a Brazilian University.

Methods: Cross-sectional study. A census of the female staff employed in the University in Bahia, Brazil, was carried out. To collect information we used: a standardized questionnaire, anthropometric measurement (weight, height and waist circumference), arterial blood pressure and biochemical parameters (glycemia, total cholesterol, HDL-Cholesterol, triglycerides). The Framingham score was calculated.

Results: Of 564 employed in the University, 475 agreed to participate in this study (response rate: 84.2%). Age ranged from 20 to 69 years (56.2% less than 40 years). Among the risk factors, sedentarism presented the highest prevalence (69.7%); followed by HDL-Cholesterol < 40 mg/dl (36.6%); overweight (29.3%); cholesterol > 200 mg/dl (15.2%); obesity (13.3%) and Diabetes Mellitus (1.7%). The arterial hypertension prevalence was 15,3%. Twenty-one per cent of women were menopausal and 6.3% were smokers. The Framingham score (crude risk of coronary events in the next 10 years) was: 1% or higher for 340 women (71,5% of the population); 5% or higher for 64 women (13,5%) and 10% or higher for 31 women (6,7%). These results revealed that some specific groups presented high prevalence of risk factors to coronary arterial disease. A health program is needed to prevent coronary disease in this female working population.

Author(s): Kaveh Asanati, Javad GH-Sanati

Title: Cardiovascular Disorders in Workers Occupationally Exposed to N,N-dimethylformamide

Format: Poster

Background:

N,N-Dimethylformamide (DMF) has excellent solvent properties and is used intensively in the production of synthetic fibers. Limited studies have been conducted regarding cardiovascular effects of DMF.

Objective: The objective of this study is to evaluate the cardiovascular effects of DMF among exposed workers in a synthetic fiber factory.

Methods: Associated cardiovascular codes of International Classification of Diseases, Ninth Revision (ICD-9), were noted for workers.

Urine samples were taken from occupationally exposed workers at the end of the working hours and urinary N-methylformamide (NMF) was used to biologically monitor DMF levels. The measurements were done during the last fifteen years. For each exposed worker, the average of urinary NMF measurements was determined and categorized as Low if 0-10, Middle if 10-20 and High if >20 mg/g creatinine.

Results: 949 (37.5%) of 2528 employees were coded according to ICD-9 cardiovascular codes. 385(15.2%) of 2528 employees formed by exposed workers. These workers constituted 107 (11.2%) of 949 coded employees. Exposed workers were younger than non-exposed workers (mean age, 44.09 years vs. 46.78 years; $P < 0.001$). Mean values of body mass index (BMI) did not differ significantly among exposed and non-exposed groups (26.2 kg/m² and 26.3 kg/m² respectively; $P = 0.8$).

Essential hypertension was the most common cardiovascular disorder among employees (36.6%); of whom 37 (10.6%) were exposed workers. Varicose veins and hemorrhoids were the second and the third most common cardiovascular disorders, constituted 29.1% and 15.3% respectively. Ischemic heart diseases (IHD) covered 9.4% (89 employees) of cardiovascular disorders. DMF exposed workers made 13.5% (12 employees) of IHDs. The obtained results showed no association between exposure status and essential hypertension (odds ratio: 0.62, 95% CI: 0.43, 0.901), and DMF exposure and IHD (odds ratio: 0.86, 95% CI: 0.46, 1.60).

The mean exposure period for exposed workers was 19.39 years (range 6-26 years); 28.3% of cases had low, 39.2% had middle, and 32.3% had high urinary NMF. ANOVA revealed no significant difference between the average of age, BMI, and exposure period of these three groups ($P > 0.05$). In the exposed population, associations between high DMF exposure and IHD (odds ratio: 1.98, 95% CI: 0.44, 8.93), and high DMF exposure and essential hypertension (odds ratio: 1.25, 95% CI: 0.50, 3.12) were observed.

Conclusions: This study demonstrated that high DMF exposure might have association with IHD and essential hypertension. Further investigations are needed to elucidate the pathologic and functional changes of cardiovascular system in DMF-exposed populations.

Session: Pos

Abstract No: 099

Author(s): Rammohan V. Maikala and Yagesh N. Bhambhani

Title: ACUTE CARDIORESPIRATORY RESPONSES IN HEALTHY MEN AND WOMEN DURING EXPOSURE TO SEATED WHOLE-BODY VIBRATION

Format: Poster

BACKGROUND: Whole-body vibration (WBV), defined as an oscillating motion transmitting to the whole-body, depends primarily on its intensity (frequency, acceleration, amplitude, duration), type of vibration source, and direction of its input to the human body.

Occupational exposure to WBV usually involves concomitant physical and physiological stresses that may hinder successful human performance. The influences of backrest support and handgrip contractions on acute cardiorespiratory responses were evaluated in healthy men (n=13) and women (n=14) during exposure to seated whole-body vibration (WBV).

METHOD: Following assessment of aerobic fitness during arm cranking, subjects seated on a vibrating base were exposed to three doses in randomized order (3, 4.5, and 6 Hz), on separate days. Each testing day included 6 min baseline without WBV, 8 min of WBV exposure either 'with' or 'without' backrest, 4 min recovery, followed by 8 min of WBV with opposite backrest condition, and 4 min recovery. During each WBV exposure, subjects performed right hand maximal voluntary intermittent rhythmic handgrip contractions for one minute. During baseline and before completion of WBV 'with' and 'without' backrest, subjects performed CO₂ rebreathing maneuver for cardiac output measurements. Physiological responses were monitored using a Metabolic Measurement Cart and a Polar Heart Rate monitor.

RESULTS: Four-way analysis of covariance showed that physiological responses during WBV conditions were similar to those experienced during a typical light physical activity. At 4.5 and 6 Hz, absolute and relative oxygen uptake demonstrated significantly greater responses during sitting 'without' backrest than 'with' backrest (P<0.01). At 3 and 4.5 Hz, heart rate and oxygen pulse responses were much greater during WBV combined with handgrip contractions than during WBV alone (P<0.01), demonstrating physical work during WBV will enhance greater metabolic responses. Stroke volume was the lowest at 4.5 Hz (P<0.01). Influence of aerobic fitness was evident only in absolute oxygen uptake, oxygen pulse, ventilation volume, and tidal volume (P<0.01).

CONCLUSIONS: This study demonstrates that subjects exposed to physical work during WBV will experience greater metabolic responses compared to WBV alone. Despite low metabolic rates during WBV, the effect of aerobic fitness was evident only in absolute and relative oxygen uptake and oxygen pulse during handgrip contractions (P<0.01), suggesting the importance of aerobic fitness during seated WBV.

Session: Pos

Abstract No: 101

Author(s): Jian Li, Do-Myung Paek, Ki-Do Eum, Mi-Sun Lee, Hye-Eun Lee, Sung-Il Cho

Title: Job Strain and Cardiovascular Risk Factors in Korean Industrial Workers

Format: Poster

Objective: To examine the association between job strain (defined by the job demand-control model) and cardiovascular risk factors in Korean industrial workers.

Methods: 968 male workers in an industrial enterprise of Korea participated this study. Job strain was assessed with Job Content Questionnaire (JCQ). The cardiovascular risk factors were examined with glycosylated hemoglobin (HbA1c), total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, and triglyceride.

Results: After adjustment for relevant covariates, multivariate linear regression analysis showed that high job strain was associated with elevated HbA1c concentration (0.11% increase, P<0.05) than low job strain, and job demand was associated with 2.52 mg/dl increase in plasma total cholesterol (P<0.05).

Conclusion: The findings suggest that in Korean industrial workers job strain is associated with unfavorable risk to cardiovascular diseases.

Keywords: Job strain • glycosylated hemoglobin • cholesterol • Korean workers

Session: Pos

Abstract No: 122

Author(s): Paul Landsbergis, Peter Schnall

Title: Psychosocial job stressors and cardiovascular disease in the Framingham Offspring Study: A prospective analysis.

Format: Poster

An association between job strain (high demand-low control work) and cardiovascular disease (CVD) or coronary heart disease (CHD) has been observed in a majority of the studies that have tested these associations (1). However, a recent analysis of data from the Framingham Offspring Study found no association between job strain and mortality or incident CHD in either men or women over a 10-year follow-up period. Contrary to expectations, women with active (high demand-high control) jobs had a 2.8-fold increased risk of CHD (95% CI: 1.1, 7.2) compared to women with job strain (2).

We will present data from the Framingham Offspring Study, third examination cycle (1984–1987), which included 3,038 participants, 1,711 men and 1,327 women, who responded that they had been employed outside the home most of their adult years. Using Cox proportional hazards regression analysis, we will estimate relative risks of mortality, CVD, CHD, myocardial infarction, and angina pectoris at 5-year and 10-year follow-up in relation to specific job characteristics, including job demands, job decision latitude, skill discretion, decision authority, supervisor and coworker support, and job strain at baseline. Two versions of the job strain variable will be constructed: one based on sample medians; and one based on national averages from the U.S. Quality of Employment Surveys. All analyses will be repeated within strata of SES (as measured by education, occupational status, and blue-collar vs. clerical/technical vs. white-collar). Models will be presented first adjusted for age, then adjusted for potential confounders (body mass index, marital status, total/HDL, glucose levels, and alcohol use) and finally adjusted for potential mediators (systolic blood pressure, smoking status, level of education, and level of physical activity).

(1) Belkic K, Landsbergis P, Schnall P, Baker D. Is job strain a major source of cardiovascular disease risk? *Scandinavian Journal of Work Environment and Health* 2004;30(2):85-128.

(2) Eaker E, Sullivan L, Kelly-Hayes M, D'Agostino R, Benjamin E. Does job strain increase the risk for coronary heart disease or death in men and women? *American Journal of Epidemiology* 2004;159:950-958.

