comfort and also in occupational productivity of computer users. The symptoms may include eyestrain, headaches, ocular discomfort, dry eye, diplopia and blurred vision after long time computer use. This paper aims to identify the frequency of visual complaints in workers who usually use computer and evaluate ergonomics conditions in the workplace.

Methods Cross-sectional observational study performed in the administrative sector of an environmental sanitation company in the city of Santo André, southeastern of Brazil. The population was 31 computer using workers. They answered questionnaire about sociodemographic data, ergonomics knowledge and clinical complaints. It was assessed near visual acuity, using Jaeger table. Checklists for ergonomic evaluation and luminance mensuration were performed in the workplaces.

Results Most participantes were female (77.42%) and over 40 years old (54.84%). The median was five years at work. They reported breaks every two hours (48,4) and had knowledge about workstation ergonomic adjustments (80,6%). The ergonomic checklist to using computer workplace indicated a good ergonomic condition. The luminance mensurations were insufficient in 9.7% of the workstations. All of them have sufficient near acuity but visual correction was necessary for 80.6%. CVS complaints were reported by 45.2% of the participants.

Conclusion There are CVS cases in this population but there isn't problems as participants with bad visual acuity, low luminance of workstations or bad ergonomic workplace conditions. It's necessary to study others causes of CVS, such as psychosocial factors at work, to program policies for this problem. Eyes health is related with quality of life and productivity among workers. To establish regular occupational evaluations about ambiental conditions and workers health is indicated to earlier detection of problemas and implement adequate corrections.

139 THE DETERMINANT OF OSH PERFORMANCE: A STUDY ON ERGONOMIC WORK SYSTEM

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10.1136/oemed-2013-101717.139

The implementation of Occupational Safety and Health Act (OSHA) at work purposed to ensure security of the safety, health and welfare of persons as well as to protect other against risks. In Malaysia, numerous actions had been undertaken in increasing the level of awareness of OSH at work, yet, studies show that occurrence of safety and health related problem are crucial. This situation posed serious inconvenience in relation to productivity and performance. Studies claims that OSH awareness are still lack, and awareness on the importance of ergonomics in the workplace, such as issues on unhealthy work environments, excessive workloads and lack of participatory ergonomic proved one of the main causes of safety and health-related problems at work. Consequently, it will lead to negative financial and non-financial performance at work. Thus, study aims to examine the relationship between ergonomic work systems (EWS) and OSH performance, in particular, workplace accident and occupational stress. This study utilised the Work System and Balance Theory to examine the relationship between the variables, hence to strengthen the development of research framework. The study was based on a sample of 40 respondents from manufacturing sector located in Penang Malaysia. Data is collected through a questionnaire distributed that has three sections, which are questions about respondents' demography, EWS and OSH performance. The result shows that, most of workers are not aware on the issues related to workplace ergonomic. It also found that EWS were the main concern of workers that leads to workplace accident and occupational stress at work. Therefore, changes related in practicing OSH aspects at work such as altering work condition and environment, enforcing ergonomic aspects, implementing OSH training and safety culture, will help to ensure employee's safety and health would lead to a better organisational performance in the long run.

140 ERGONOMIC RISK FACTOR ASSESSMENT OF UPPER EXTREMITIES MUSCULOSKELETAL DISORDERS (UEMSDS) BY COMPREHENSIVE EXPOSURE INDEX (CEI) IN TEXTILE INDUSTRY

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10.1136/oemed-2013-101717.140

Background & Objective (s) Upper extremities musculoskeletal disorders (UEMSDs) are referred as the most pervasive and significant problem in textile industries worldwide. Therefore, this study was conducted to assess the ergonomic risk factors of UEMSDs by Comprehensive Exposure Index (CEI) in a textile industry.

Materials & Methods 425 accidentally-sampled workers of Ghaemshahre textile industry (North of Iran) were studied in a cross-sectional study. A combined method including: Interviews (to gain workers' personal characteristics and understand job processes), Nordic Musculoskeletal Questionnaire (NMQ; to obtain UEMSDs pain symptoms and signs prevalence), Hierarchical Job Analysis (HJA; to analyse jobs before assessment) and Comprehensive Exposure Index (CEI; to assess the ergonomic risk factor of UEMSDs) were used and the gathered data were analysed.

Results Percentage pain symptoms in hand & fingers, wrist, forearm, elbow, arm, and shoulder were 83.61%, 78.28%, 71.39%, 57.09%, 41.22%, and 24.18% respectively. There were significant correlation between prevalence of hand & fingers musculoskeletal disorders with workers' age, job experience, and stature ($p < 0.05$). CEI revealed that 11.28% of tasks posed on level 1 (Safe level), 22.61% of tasks posed on level 2 (uncertain level), 47.12% of tasks located on level 3 (slight risk level), and 18.99% of tasks posed on level 4 (significant risk level). There were significant associations between CEI scores and pain symptoms prevalence of hand & fingers and wrists ($P < 0.005$).

Discussion and Conclusions Most repetitive tasks of textile industry feature ergonomic risk factors that can induce UEMSDs. The CEI model was found to be a sensitive model to assess the ergonomic risk factor causing UEMSDs in textile industries and any changes in exposure before and after ergonomic interventions.

141 PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG DENTAL PERSONNEL IN KHON KAEN PROVINCE, THAILAND

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10.1136/oemed-2013-101717.141

Objective This cross sectional study was conducted to determine the prevalence of musculoskeletal disorders (MSDs) among government dental personnels in Khon Kaen Province of Thailand.
Methods There were 282 dental personnels enrolled into this study. Data were collected by interviews with the modified structural questionnaires. Descriptive statistics were used to describe characteristics and inferential statistics were MSDs prevalence and confidence interval (95%CI).
Results The results showed that most participants were female (81.9%), the minimum and maximum age were 20 years and 59 years, respectively (mean = 32.8 ± 9.4 years). Most participants had body mass index at normal level (18.5 - 22.9 kg/m^2) for 55.3%. Most positions were dental nurses (46.4%), dentists (22.0%) and patient assistants (18.1%), respectively.

For the last 7-day and 1 month period, the prevalence of MSDs were 57.8% (95% CI = 0.52 - 0.64) and 93.6% (95% CI = 0.91 - 0.96), respectively. The highest prevalence at severe level of pain were found at areas of shoulder (23.0%), lower back (18.1%), and neck (15.6%), respectively. Frequency of MSDs concidering everyday accurence found on areas of neck (12.8%), lower back (7.1%), shoulder (6.4%) and upper back (6.4%), respectively. Among 264 MSDs cases of dental personnels, the report of pain impacted to daily activity was 76.1%. The report of work was related-MSDs was 71.2%. Symptoms was occured at evening time after work (41.3%). The intake of painkillers or treatment by Thai traditional medicine program was 64.4%.
Conclusions The results identified neck-shoulder-back pain among dental personnels by showing the severity and the frequency of pain. Therefore there should be the health surveillance program of neck- shoulder- back pain among dental personnels. This findings are useful for the *prospective cohort*study to find out the risk factors for neck-shoulder-back pain among dental personnels.

Session: S. Health impact II

142 THE ASSOCIATION BETWEEN STANDARD THRESHOLD SHIFT AND HEALTH EFFECTS IN NOISE WORKING ENVIRONMENT AMONG WORKERS IN A MOTOR COMPRESSOR FACTORY

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10.1136/oemed-2013-101717.142

Introduction Working in a noisy environment puts employees hearing health at risk. Standard threshold shift (STS) can be used as a screening method to detect early indications of hearing deterioration.
Objective The objective of the study was to investigate health effects related to STS in motor compressor workers.
Methods A cross sectional study of 464 motor compressor workers was conducted including hearing health examination by audiometer, and noise level in the workplace was monitored. Workers who reported having hobbies relating to noise e.g. gun shooting, or a personal history of disease relating to the ear were excluded. The relationship between health effects and workers with STS was studied.
Results There were more men 81.90% (aged range 31–40 years old) than women working for the company. The average continuous noise level in the workplace was 84.14 ± 5.21dB (A). The study showed that working at the factory for more than 14 years (OR = 3.84, 95% CI 1.54 - 9.56) and being exposed to noise at least 8 hours a day (OR = 2.12, 95% CI = 1.02 - 4.40) results in a significant change of STS.

Workers with STS showed significant communication difficulties (OR = 1.89, 95% CI = 1.03 - 3.49) and stress/nausea more than workers without STS, although not statistically significant (OR = 1.54, 95% CI = 0.90 - 2.65).
Conclusions Workers exposed to continuous noise in a motor compressor industry are at risk of STS and adverse effects on health. Duration of exposure to noise is a key factor harm to hearing health. STS could be used as a tool to screen workers who have hearing health problems.

143 PERSISTENT ROTATING SHIFT WORK IS A SECOND HIT CONTRIBUTING TO ABNORMAL LIVER FUNCTION AMONG ON-SITE WORKERS HAVING FATTY LIVER

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10.1136/oemed-2013-101717.143

Objective To investigate the relationship between elevated serum alaninetransaminase (ALT) and persistent rotating shift work (p-RSW) among employees with sonographic fatty liver (SLF).
Methods The authors performed a retrospective analysis on a cohort of electronics manufacturing workers. The records of 758 workers (507 males, 251 females) with initially normal ALT and a mean age of 32.9 years were analysed.
Results A total of 109 workers (14.4%) developed elevated ALT (e-ALT) after five years. Compared with those having neither initial SFL nor p-RSW exposure, multivariate analysis indicated that employees who had initial SFL but without p-RSW finally had a higher risk (odds ratio: 2.9; 95% confidence interval (CI): 1.7–5.1) for developing e-ALT; workers with baseline SFL plus p-RSW had a 3.7-fold increased risk (95% CI: 1.8–7.5).
Conclusions SFL poses a conspicuous risk for the development of e-ALT, and persistent p-RSW exposure significantly aggravates the development of e-ALT among on-site workers with preexisting SLF.

144 NEUROPSYCHOLOGICAL EFFECTS AND LOW EXPOSURE TO ORGANIC SOLVENTS IN WORKERS AT A PAINT FACTORY IN MEXICO CITY

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10.1136/oemed-2013-101717.144

Objective It is likely that organic solvents (OS) cause neuropsychological alterations even at low concentrations. The aim is to identify the presence of neuropsychological deficits in workers exposed to low levels of organic solvents.
Methods A cross sectional study was performed on 208 workers from a paint factory who were exposed to lower mean concentrations, as per Mexican official norms, to OS mixtures, mainly of toluene and xylene. Using the cumulative index for toluene (concentration weighted in time x years working at the