

## Analisis gangguan fungsi paru pada pekerja dengan pajanan pelarut organik di pabrik sepatu PT. X = Analysis of lung function impairment due to solvent exposure in shoes maker workers

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### Abstrak

Latar Belakang : Pekerja di manufaktur sepatu setiap harinya terpajan beragam hazard. Salah satu pajanan adalah pelarut organik. berbagai penelitian melaporkan hubungan yang kuat antara pajanan pelarut organik dengan gangguan fungsi paru obstruksi dan restriksi. Namun belum banyak studi dilakukan untuk mempelajari antara hubungan antara pajanan pelarut organik di manufaktur sepatu dengan faktor-faktor risiko dan gejala klinis gangguan fungsi paru.

Metode : Desain potong lintang melibatkan 134 subyek, Cementing n=67 dan stockfit n=67. Pada bagian cementing terpajan pelarut Aseton, bagian stockfit oleh campuran pelarut Aseton dan klorin. Seluruh subyek dilakukan pemeriksaan fungsi paru dengan menggunakan spirometer menilai KVP dan VEP1/KVP. Subyek dilakukan interview untuk mengetahui gejala klinis, riwayat penyakit dahulu dan riwayat pekerjaan. Kadar pelarut organik di kedua tempat diukur. Analisis statistik menggunakan Chi square dengan p0,05.

Multivariat menggunakan regresi logistik metode enter.

Hasil : Didapatkan 23 orang (17%) mengalami gangguan fungsi paru restriksi. Tidak ada hubungan bermakna antara pajanan pelarut organik, faktor-faktor risiko demografi dan okupasi dengan gejala klinis gangguan fungsi paru restriksi ( $p > 0.05$ ) /disebabkan masa kerja  $< 10$  tahun. Proporsi subyek dengan gejala bronkitis kronik, di cementing 40.3%, stockfit 62.7%. analisis chi-square menegaskan adanya hubungan bermakna. Di bagian cementing, diperoleh hasil berikut, faktor risiko umur ( $p < 0.015$ ), masa kerja ( $p < 0.05$ ), dan total kumulatif pajanan ( $p < 0.05$ ). Dan hasil uji regresi logistik didapat bahwa di bagian cementing, masa kerja faktor risiko dominan terhadap gejala bronkitis kronik p.

Kesimpulan : Dari studi dapat disimpulkan bahwa pajanan pelarut organik mengakibatkan gejala klinis bronkitis kronik yang berhubungan dengan faktor risiko usia, masa kerja, dan total kumulatif pajanan. Tidak ada hubungan bermakna antara pajanan pelarut organik terhadap gangguan fungsi paru. Perlu langkah preventif guna mencegah berkembangnya gejala bronkitis kronik menjadi gangguan fungsi paru. Dilakukan dengan pemakaian alat pelindung diri sesuai dengan pajanan kimia dan pemasangan local exhaust.

.....Background : Depending on the kinds of production sites, Shoe factory workers are exposed to many kinds of occupational hazards with one of them being exposure to organic solvent. Organic solvent exposure has been reported to have adverse pulmonary effects including obstructive and restrictive pulmonary diseases. The study aimed to investigate association between organic solvent exposure, risk factor, and clinical symptoms of pulmonary functions impairment among shoe factory workers.

Methods : Cross sectional study group consist of 134 workers in two different production parts i.e cementing n 67 and stockfit n 67. Subjects works in cementing part were exposed to acetone, while in stockfit to a combination of acetone and chlorine. To all subjects, pulmonary functions testing including measurement of FVC and FEV1 FVC Value were performed asking about clinical symptoms and the histories of both their health and work records. Statistic analysis using Chi square p,0,05 and logistic regression for multivariate.

Result : All of subject, 23 17 suffered from restrictive diseases. However bivariate analysis using chi square

did not show significant correlation between organic solvent exposure, demographic risk factors, clinical symptoms and restrictive lung diseases  $p < 0.05$ . This probably due to the short work duration of the subject 10 years. Despite this observation, it is important to note that the study strongly identified chronic bronchitis symptoms among workers in both cementing 40.3 and in stockfit 62.7. Furthermore chi square analysis showed significant correlation between risk factors and chronic bronchitis symptoms in both places. in cementing, it was observed that age ( $p < 0.05$ ), work duration ( $p < 0.05$ ) and total cumulative exposure ( $p < 0.015$ ) were significantly contributed to the symptoms. Whereas in stockfit, the risk factors were as follows, work duration ( $p < 0.05$ ) and total cumulative exposure ( $p < 0.05$ ). Logistic regression analysis showed that in cementing, work duration was observed to be the greatest risk factor to the bronchitis related-symptoms,  $p < 0.008$ , OR 12.100 and CI95% (1.92-76.23, whereas in stockfit, total cumulative exposure was associated the most with the symptoms  $p < 0.039$  OR 6.667 CI95% )1.099-40.434).

Conclusions : The result from the present studi indicate that occupational exposure to organic solvent has significant association with clinical symptoms related to chronic bronchitis. Risk factors such as age, work duration, and total cumulative exposure are observed to contribute to the symptoms. However, exposure to organic solvents did not significantly caused lung function disorder. Preventions are required to avoid the clinical symptoms develop into pulmonary impairment, such as the use personal protection equipment and local exhaust apparatus.