

## HUBUNGAN ANTARA KADAR DEBU RESPIRABEL DENGAN PARAMETER UJI FUNGSI PARU PADA PEKERJA POWDER COATING PT “X” SURAKARTA

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### INTISARI

**Latar Belakang:** Campuran serbuk pelapis *powder coating* yang mengandung barium sulfat, *polyester* dan *resin* dapat menimbulkan pneumokoniosis, hipersensitivitas, asma kerja dan penurunan parameter uji fungsi paru. Serbuk pelapis tersebut digunakan pada proses *powder coating* PT X Surakarta dengan cara menyemprotkan serbuk pelapis ke logam yang tergantung di kabin semprot dan konveyor terbuka. Partikel debu serbuk pelapis bercampur dan mempengaruhi kualitas udara tempat kerja. Kualitas udara berasosiasi dengan penyakit paru kerja. Partikel debu dihirup pekerja dapat mempengaruhi fungsi paru pekerja. Belum banyak penelitian mengenai efek kesehatan proses *powder coating* di Indonesia menjadi alasan penelitian ini dilakukan. Tujuan penelitian ini adalah untuk mengetahui apakah ada hubungan antara kadar debu respirabel dengan parameter uji fungsi paru pekerja *powder coating* PT X Surakarta.

**Metode Penelitian:** Penelitian ini menggunakan metode kuantitatif. Penelitian ini merupakan penelitian observasional analitik dengan desain *cross sectional*. Sampel sejumlah 16 pekerja terpapar debu selama 40 jam/minggu. Kadar debu inhalabel tempat kerja diukur menggunakan *low volume sampler*, debu respirabel diukur menggunakan *personal dust sampler* dan fungsi paru diukur menggunakan spirometer. Variabel yang diteliti adalah kadar debu respirabel dengan parameter uji fungsi paru pekerja, dan karakteristik pekerja sebagai variabel pengganggu. Analisis data menggunakan analisis univariat untuk mengetahui gambaran; uji korelasi untuk mengetahui besar dan arah hubungan variabel, dan uji regresi logistik untuk mengetahui pengaruh variabel kadar debu respirabel dan karakteristik pekerja terhadap parameter uji fungsi paru.

**Hasil Penelitian:** Rerata kadar debu respirabel adalah 37,06 mg/m<sup>3</sup>; diatas NAB pada semua sampel. Uji paru dilakukan pada 16 pekerja; terdapat 9 pekerja yang mengalami gangguan fungsi paru; dan tidak berkaitan langsung dengan paparan debu respirabel ditempat kerja. Karakteristik pekerja memberikan pengaruh 43,8% terhadap parameter uji fungsi paru. Hasil uji korelasi Spearman menunjukkan tidak terdapat hubungan antara kadar debu respirabel dengan uji fungsi paru pekerja *powder coating* di PT X Surakarta

**Kesimpulan:** Tidak ada hubungan antara kadar debu respirabel dengan parameter uji fungsi paru pekerja *powder coating* di PT X Surakarta.

Kata kunci: *powder coating*, debu, paru - uji fungsi

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**THE CORELATION BETWEEN RESPIRABLE DUST  
CONCENTRATION AND PULMONARY FUNCTION TEST  
PARAMETER OF POWDER COATING WORKERS AT PT “X”  
SURAKARTA**

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**ABSTRACT**

**Background:** Mixture of 3 coating powder containing barium sulfate, polyester and resin could result pneumoconiosis, hypersensitivity, occupational asthma and decreased of pulmonary function test (PFT) parameter. These coating powder were used at PT X Surakarta. Coating powder sprayed into metal hanging on open spraying booth and conveyor. Coating powder dust particle mixed then contaminated airborne quality in the working area. Workplace airborne quality is associated with occupational lung disease. Inhaled dust particle could affect worker pulmonary function. Occupational lung effect and limited research of powder coating in Indonesia becomes the background of this research. The purpose of this study is to examine the correlation between respirable dust concentrations against pulmonary function test parameter of powder coating worker at PT X Surakarta

**Research Method:** This study uses quantitative method, analytic observational research using cross sectional design. There were 16 workers were exposed to coating powder dust for 40 hours/ week. Airborne dust is measured by low volume sampler, respirable dust is measure by personal dust sampler, and worker's PFT is measure by spirometer. The observed variables were respirable dust concentration against PFT parameter and worker characteristic as confounding factor. Data analysis uses univariate analysis as description; correlation test to examine direction and correlation value of variable; and logistic regression to examine influence of respirable dust concentration and worker characteristic against PFT parameter

**Result:** The mean value of respirable dust concentration which is 37,06 mg/m<sup>3</sup> is above the threshold limit value (TLV) for all samples. Sixteen workers performed PFT, and there were 9 workers with pulmonary function disorder and not direct correlated to respirabel dust exposure at working area. Worker characteristic gives influence 43,8 % to PFT. Spearman correlation test result showed there was no correlation between respirable dust concentration against worker PFT parameter.

**Conclusion:** There was no correlation between respirable dust concentration and pulmonary function test parameter of powder coating workers at PT X Surakarta

Key words: powder coating, dust, pulmonary, function test

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