Hubungan konsentrasi PM2,5 di lingkungan kerja dengan kadar malondialdehyde sebagai biomarker stres oksidatif pada pekerja di sentra pengasapan ikan Bandarharjo Semarang tahun 2019 = Association of PM2,5 concentration in workspace with MDA level as stress oxidative biomarker in workers at fish smoking industry Bandarharjo Semarang 2019

Cita Fitria Putri, author

Abstrak

Partikel halus berukuran 2,5 µm (PM2,5) diketahui menimbulkan risiko kesehatan terbesar bagi manusia karena kemampuannya untuk masuk jauh ke dalam paru-paru dan bahkan aliran darah. Pekerja di industri pengasapan ikan terus terpapar oleh konsentrasi tinggi PM2,5 yang terkandung dalam asap hasil pembakaran. Asap diketahui mengandung berbagai zat radikal bebas yang dapat memicu stres oksidatif pada organ dan jaringan tubuh. Penelitian ini bertujuan untuk menganalisis hubungan konsentrasi PM2,5 di lingkungan kerja dengan kadar MDA yang merupakan salah satu biomarker stres oksidatif. Desain studi yang digunakan adalah Cross-sectional. Subyek penelitian adalah pekerja di pengasapan ikan Bandarharjo Semarang sejumlah 104 orang. Pengumpulan data dilakukan melalui pengukuran konsentrasi PM2,5 di udara, pengambilan sampel darah untuk uji kadar MDA, dan kuesioner. Hasil penelitian menunjukkan adanya hubungan yang signifikan antara kadar MDA dengan konsentrasi PM2,5 (p=0,007), konsumsi alkohol (p=0,022) dan masa kerja (p=0,019). Konsentrasi PM2,5 di rumah pengasapan skala kecil lebih tinggi dibanding rumah skala sedang dan besar. Sedangkan rata-rata kadar MDA pekerja adalah sebesar 0,996 µg/mL (95% CI 0,869-1,145). Adapun dari hasil Regresi Logistik Ganda diperoleh bahwa pekerja yang terpapar PM2,5 konsentrasi tinggi berisiko 4,433 kali untuk memiliki kadar MDA di atas rata-rata setelah dikontrol oleh variabel IMT, konsumsi alkohol, masa kerja, dan lama kerja. Temuan ini perlu ditindaklanjuti dengan meningkatkan pembinaan kepada pekerja, melakukan perbaikan sirkulasi udara di ruang pengasapan, dan pengaturan jam kerja pekerja, sehingga risiko kesehatan dapat diminimalisasi.
.....Fine particles with diameter 2.5 µm (PM2.5) are known to pose the greatest health risk to humans because of their ability to enter deeply into the lungs and even the bloodstream. Workers in the fish smoking industry continue to be exposed to high concentrations of PM2.5 contained in combustion fumes. Smoke is known to contain various free radical substances that can trigger oxidative stress in the organs and tissues of the body. This study aims to analyze the relationship of PM2.5 concentration in the work environment with MDA levels which is one of the biomarkers of oxidative stress. The study design used was Cross-sectional. The research subjects were 104 workers in Bandarharjo fish smoking industry in Semarang. Data collection was carried out through measurements of PM2.5 concentrations in the air, blood sampling for MDA levels, and questionnaires. The results showed a significant relationship between MDA levels and PM2.5 concentrations (p=0.007), alcohol consumption (p=0.022) and years of work (p=0.019). PM2.5 concentrations in small-scale smoke houses were higher than medium and large scale houses. While the average MDA level of workers is 0.996 µg/mL (95% CI 0.869-1.145). As for the results of the Multiple Logistic Regression, it was found that workers exposed to high concentrations of PM2.5 risk 4,433 times to have MDA levels above the average after being controlled by BMI variables, alcohol consumption, years of

work, and duration of work. This finding needs to be followed up by increasing coaching to workers, improving air circulation in the smoking room, and regulating workers' working hours, so that health risks can be minimized.