

ABSTRACT

THE RELATIONSHIP BETWEEN PARTICULATE MATTER 2.5 LEVELS AND INDIVIDUAL FACTORS WITH SICK BUILDING SYNDROME AMONG WORKERS AT PT SEMEN BATURAJA TBK IN 2025

By

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Background: Indoor Air Quality (IAQ) plays an important role in maintaining workers' health. One of the main components affecting IAQ is Particulate Matter 2.5 (PM_{2.5}), which is fine particles measuring $\leq 2.5 \mu\text{m}$ that can penetrate the respiratory system down to the alveoli. Long-term exposure to PM_{2.5} has the potential to cause Sick Building Syndrome (SBS), a collection of nonspecific symptoms such as headache, eye irritation, fatigue, and respiratory disorders. This study aims to determine the relationship between PM_{2.5} levels and individual factors with the incidence of SBS among workers at PT Semen Baturaja Tbk in 2025.

Methods: This research is an analytical observational study with a cross-sectional approach. The study population consisted of all workers at PT Semen Baturaja Tbk who met the inclusion criteria, and a total of 65 respondents were included using the total sampling technique. PM_{2.5} levels were measured at 65 work area points using an Air Quality Monitor (AQM), while SBS data were collected using a standardized questionnaire. Data were analyzed using the Chi-Square test with a significance level of $p < 0.05$.

Results: The results showed that 50 out of 65 workers (76.9%) experienced SBS. The Chi-Square test indicated no significant relationship between PM_{2.5} levels ($p = 0.802$), age ($p = 0.821$), gender ($p = 0.961$), and working period ($p = 0.531$) with the incidence of SBS. However, there was a significant relationship between smoking habits and SBS ($p = 0.031$), indicating that smokers had approximately five times higher risk of experiencing SBS compared to non-smokers.

Conclusions: : There is a significant relationship between smoking habits and the incidence of Sick Building Syndrome among workers at PT Semen Baturaja Tbk, where smokers have approximately five times higher risk of experiencing SBS compared to non-smokers.

Keywords: individual factors, Particulate Matter 2.5, Sick Building Syndrome, smoking habits, workers

ABSTRAK

HUBUNGAN ANTARA KADAR PARTICULATE MATTER 2,5 DAN FAKTOR INDIVIDU DENGAN SICK BUILDING SYNDROME PADA PEKERJA DI PT SEMEN BATURAJA TBK PADA TAHUN 2025

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Latar Belakang: *Indoor Air Quality* (IAQ) berperan penting dalam menjaga kesehatan pekerja. Salah satu komponen utama yang memengaruhi IAQ adalah *Particulate Matter 2,5* (PM_{2.5}), yaitu partikel halus berukuran $\leq 2,5 \mu\text{m}$ yang dapat menembus sistem pernapasan hingga alveoli. Paparan PM_{2.5} dalam jangka panjang dapat memicu berbagai keluhan yang dikenal sebagai Sick Building Syndrome (SBS), seperti sakit kepala, iritasi mata, rasa lelah, hingga gangguan pernapasan. Penelitian ini bertujuan mengetahui hubungan antara kadar PM_{2.5} dan faktor individu dengan kejadian SBS pada pekerja di PT Semen Baturaja Tbk tahun 2025.

Metode: Penelitian ini merupakan penelitian analitik observasional dengan pendekatan *cross sectional*. Populasi penelitian melibatkan seluruh pekerja di PT Semen Baturaja Tbk yang memenuhi kriteria inklusi, dan sebanyak 65 responden diikutsertakan dengan teknik *total sampling*. Pengukuran kadar PM_{2.5} dilakukan di 65 titik area kerja menggunakan *Air Quality Monitor* (AQM), sedangkan data SBS dikumpulkan menggunakan kuesioner terstandar. Analisis data dilakukan dengan uji *Chi-Square* dengan ($p < 0,05$).

Hasil: Hasil penelitian menunjukkan bahwa 50 dari 65 pekerja (76,9%) mengalami SBS. Hasil uji *Chi-Square* menunjukkan tidak terdapat hubungan signifikan antara kadar PM_{2.5} ($p=0,802$), usia ($p=0,821$), jenis kelamin ($p=0,961$), dan masa kerja ($p=0,531$) dengan kejadian SBS. Namun, terdapat hubungan signifikan antara kebiasaan merokok dan SBS ($p=0,031$), yang berarti pekerja yang merokok memiliki kemungkinan sekitar lima kali lebih besar untuk mengalami SBS dibanding mereka yang tidak merokok.

Kesimpulan: Terdapat hubungan yang signifikan antara kebiasaan merokok dengan kejadian *Sick Building Syndrome* pada pekerja PT Semen Baturaja Tbk, di mana pekerja perokok memiliki risiko sekitar 5 kali lebih tinggi mengalami SBS dibandingkan dengan pekerja yang tidak merokok.

Kata Kunci: faktor individu, kebiasaan merokok, pekerja, *Particulate matter 2,5*, *Sick Building Syndrome*.