ABSTRAK

Analisis Risiko Logam Berat (Pb dan Cu) dalam *Total Suspended Particulate* (TSP) Terhadap Kesehatan Siswa dan Guru di Sekolah Dasar (Studi Kasus: SDN Pandean Lamper 01 dan SDN Srondol Wetan 03)

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Bertambahnya jumlah penduduk menyebabkan meningkatnya kebutuhan alat transportasi yang berpotensi menyebabkan pencemaran udara khususnya kendaraan bermotor. Emisi yang dihasilkan kendaraan bermotor dapat berupa gas maupun partikulat yang dapat terhirup melalui saluran pernapasan sehingga berpengaruh terhadap risiko kesehatan manusia. Adapun Jenis polutan yang sering menjadi permasalahan saat sekarang ini adalah pajanan partikulat di udara khususnya *Total Suspended Particulate* (TSP) yang berukuran ≤ 100 μm. *Total Suspended Particulate* (TSP) tersebut mengandung berbagai unsur logam berat diantaranya Pb dan Cu yang berbahaya terhadap kesehatan masyarakat sekitar apabila terpapar dalam waktu yang lama. TSP dan logam berat di dalamnya yaitu Pb dan Cu dianalisis untuk mengetahui besarnya konsentrasi pencemar dan nilai risiko terhadap responden yang diteliti yaitu siswa kelas 1, kelas 6, guru SDN Pandean Lamper 01 dan SDN Srondol Wetan 03, serta membandingkan hasil analisis risiko antara kedua SD tersebut. Alat yang digunakan dalam pengambilan sampel TSP adalah *High Volume Air Sampler* (HVAS) dan untuk pengukuran unsur pencemar Pb dan Cu menggunakan ICP (*Inductively Coupled Plasma*). Tingkat risiko karsinogenik *Cancer Risk Ingestion* (CR*ing*) Pb tertinggi di SDN Pandean Lamper sebesar 1,85 x 10^{-6} berisiko karsinogen karena berada dalam batas toleransi risiko kanker yaitu 10^{-6}-10^{-4} , sedangkan CR*ing* Pb tertinggi SDN Srondol Wetan 03 sebesar 7,05 x 10^{-7} tidak berisiko kanker karena di bawah batas toleransi *cancer risk* yaitu 10^{-6}-10^{-4}. *Cancer Risk Inhalation* (CR*inh*) Pb tertinggi di SDN Pandean Lamper dan SDN Srondol Wetan 03 sebesar 5,002 x 10^{-10} dan 1,9 x 10^{-10} tidak berisiko kanker karena di bawah batas toleransi *cancer risk* yaitu 10^{-6}-10^{-4} . *Hazard Index* (HI) tertinggi di SDN Pandean Lamper dan h*azard Index* (HI) Pb tertinggi di SDN Srondol Wetan sebesar 0,971 dan 0,289, tidak berisiko non karsinogen karena nilai HI 0,971 dan 0,289 di bawah batas toleransi risiko non karsinogen yaitu 1. *Hazard Index* (HI) Cu tertinggi di SDN Pandean Lamper dan SDN Srondol Wetan sebesar 0,106 dan 0,098, tidak berisiko non karsinogen karena nilai HI 0,106 dan 0,098 di bawah batas toleransi risiko non karsinogen yaitu 1.

Kata Kunci: Total partikulat tersuspensi, logam Pb, logam Cu, risiko karsinogen, risiko non karsinogen

ABSTRACT

Heavy Metal Risk Analysis (Pb and Cu) in Total Suspended Particulate (TSP) on Student and Teacher Health in Elementary Schools (Case Study: SDN Pandean Lamper 01 and SDN Srondol Wetan 03)

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Increasing population causes the increasing demand for transportation equipment that has the potential to cause air pollution, especially motor vehicles. Emissions generated by motor vehicles can be either gas or particulates that can be inhaled through the respiratory tract so as to affect human health risks. The type of pollutant that is often the current problem is particulate exposure in the air, especially Total Suspended Particulate (TSP) measuring ≤ 100 μm. Total Suspended Particulate (TSP) contains a variety of heavy metal elements such as Pb and Cu which are harmful to the health of the surrounding community if exposed for a long time. TSP and heavy metals in Pb and Cu were analyzed to find out the amount of pollutant concentration and risk value to the respondents studied were the students of grade 1, grade 6, the teacher of SDN Pandean Lamper 01 and SDN Srondol Wetan 03, and compared the risk analysis result between the two primary The. The tools used in sampling TSP are High Volume Air Sampler (HVAS) and for measurement of Pb and Cu pollutants using ICP (Inductively Coupled Plasma). Carcinogenic risk level Cancer Risk Ingestion (CRing) The highest Pb in SDN Pandean Lamper of 1.85 x 10-6 is carcinogenic risk because it is within the limit of cancer risk tolerance that is 10-6-10-4, while the highest CRB Pb of SDN Srondol Wetan 03 is 7.05 x 10-7 is not at risk of cancer because it is below the cancer risk tolerance limit of 10-6-10-4. Cancer Risk Inhalation (CRinh) The highest Pb in SDN Pandean Lamper and SDN Srondol Wetan 03 of 5,002 x 10-10 and 1.9 x 10-10 are not at risk of cancer because it is below the cancer risk tolerance limit of 10-6-10-4. Highest Hazard Index (HI) in SDN Pandean Lamper and hazard Index (HI) highest Pb in SDN Srondol Wetan 0,971 and 0,289, no risk of non carcinogen because HI value 0,971 and 0,289 below non-carcinogen risk tolerance that is 1. Hazard Index HI) The highest Cu in SDN Pandean Lamper and SDN Srondol Wetan of 0.106 and 0.098, are not at risk of non-carcinogen because HI values of 0.106 and 0.098 below the non-carcinogen risk tolerance limits are 1.

***Keywords**: Total suspended particulate (TSP), Pb metal, Cu metal, carcinogenic risk (CR), non- carcinogenic risk*