

**ANALISIS KONSENTRASI PM₁₀ SECARA *REAL-TIME*
MENGUNAKAN SENSOR PURPLEAIR PADA PENGGUNA DI
ENAM TRAYEK ANGKUTAN KOTA DI KOTA PADANG**

TUGAS AKHIR

Sebagai salah satu syarat untuk menyelesaikan

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis konsentrasi PM_{10} pada enam trayek angkutan kota di Kota Padang, yaitu trayek Indarung-Pasar Raya, trayek Simpang Ampang-Pasar Raya, trayek Pasar Raya-Pasar Siteba, trayek Siti rahmah-Simpang Kuranji, trayek Pasar Raya-Batas Kota, dan trayek UNAND-Pasar Raya. Pengukuran PM_{10} dilakukan selama delapan hari pengamatan pada periode pagi hari (06.00-09.00) dan sore hari (15.00-18.00) menggunakan PurpleAir yang dipasangkan pada badan pengguna. Kondisi meteorologi (suhu, kelembapan, dan tekanan udara) diukur bersamaan dengan PurpleAir. Analisis data menggunakan analisis regresi linear sederhana dan korelasi, uji paired t-test, uji One-Way ANOVA, dan uji regresi linear berganda melalui software SPSS 25. Berdasarkan analisis konsentrasi PM_{10} secara deskriptif, trayek Sitirahmah- Simpang Kuranji memiliki nilai PM_{10} tertinggi di antara trayek lainnya yaitu $61,7 \mu\text{g}/\text{m}^3$. Korelasi antara konsentrasi PM_{10} terhadap kondisi meteorologi menunjukkan bahwa suhu dan tekanan udara berkorelasi negatif sedangkan kelembapan berkorelasi positif. Berdasarkan uji t berpasangan, disimpulkan sebagian besar trayek menunjukkan adanya perbedaan konsentrasi PM_{10} secara signifikan antar periode pengamatan, kecuali trayek 4. Hasil uji One-Way ANOVA menyimpulkan tidak terdapat perbedaan signifikan terhadap konsentrasi PM_{10} antar enam trayek, namun variasi di dalam masing-masing trayek lebih besar sehingga faktor spesifik di tiap trayek lebih berpengaruh daripada perbedaan trayek. Hasil uji regresi linear berganda menyatakan aktivitas merokok, mengetem, dan kondisi jendela memiliki pengaruh signifikan terhadap perubahan konsentrasi PM_{10} dalam angkutan kota. Rekomendasi yang disarankan untuk pengendalian konsentrasi PM_{10} pada trayek angkutan kota diantaranya melakukan uji emisi secara berkala dan edukasi kepada masyarakat terkait larangan merokok dalam kabin angkutan kota.

Kata kunci: Angkutan Kota, Kualitas Udara, Mobile Monitoring, PM_{10} , PurpleAir, Trayek Utama.

ABSTRACT

*This study aimed to analyze PM_{10} concentrations across six public transportation routes in Padang city, namely Indarung-Pasar Raya, Simpang Ampang-Pasar Raya, Pasar Raya-Siteba, Sitirahmah-Simpang Kuranji, Pasar Raya-Batas Kota, and UNAND-Pasar Raya. PM_{10} measurements were conducted over eight monitoring days during the morning period (06.00-09.00) and afternoon period (15.00-18.00) using a PurpleAir sensor attached to the participant's body. Meteorological parameters, including temperature, relative humidity, and atmospheric pressure, were measured simultaneously using a PurpleAir sensor. Data were analyzed using simple linear regression and correlation analysis, paired *t*-test, one-way ANOVA, and multiple linear regression through SPSS version 25. Based on descriptive analysis, the Sitirahmah-Simpang Kuranji route had the highest PM_{10} level among the other routes, at $61.7 \mu\text{g}/\text{m}^3$. Correlation analysis between PM_{10} concentration and meteorological conditions indicated that temperature and atmospheric pressure were negatively correlated with PM_{10} concentration, whereas relative humidity was positively correlated with it. The paired *t*-test results revealed that most routes exhibited significant differences in PM_{10} concentration between the morning and afternoon monitoring periods. Furthermore, the one-way ANOVA result indicated no significant differences in PM_{10} concentration among the six public transportation routes. However, the variation within each route was greater than between-route variation. The Multiple linear regression analysis demonstrated that smoking activities, idling, and window conditions had a significant effect on PM_{10} concentration inside public transportation. Recommendations for controlling PM_{10} concentrations on public transportation include the implementation of periodic vehicle emission testing and public education on the no-smoking rule inside these vehicles.*

Keywords: Air Quality, Main Routes, Mobile Monitoring, PM_{10} , Public Transportation, PurpleAir.