



Abstract

Air pollution is a major environmental problem these days. Air pollution is due to natural and manmade activities i.e., vehicular emissions, industrial emissions, forest burning, urbanization, and fossil fuel burning, which are highly degrading the natural environment all over the globe. Therefore, this research study was designed to identify the $PM_{2.5}$ concentrations and health risk assessment in the main bus terminals of Lahore and Peshawar. As $PM_{2.5}$ is one of the major and most notorious air pollutants, responsible for many cardiovascular diseases, its concentration remains higher than the World Health Organization guideline values in major cities of Pakistan. The samples were collected from four respective bus terminals, Haji camp bus terminal and Kohat bus terminal (Peshawar) Badami Bagh bus terminal, and Niazi bus terminal (Lahore) both in summer and winter seasons. The sampling duration was 24-hours. For sample collection, a High-Volume Reference Ambient Air Sampler was used. After sample collection, the gravimetric analysis was conducted to find out the concentrations of $PM_{2.5}$. In Peshawar, the mean $PM_{2.5}$ concentrations at Haji camp bus terminal was $80.6 \mu g/m^3$ and at Kohat bus terminal was $77.4 \mu g/m^3$ in the summer season. Whereas in Lahore, the mean concentrations of $PM_{2.5}$ at Badami bagh and Niazi bus terminals were $96.1 \mu g/m^3$ and $106 \mu g/m^3$ respectively. In the winter season the mean $PM_{2.5}$ concentration in Peshawar at Haji camp bus terminal was $135.1 \mu g/m^3$ and at Kohat bus terminal was $127.3 \mu g/m^3$. However, in Lahore, the mean concentrations of $PM_{2.5}$ were $172.2 \mu g/m^3$ and $183.6 \mu g/m^3$ at Niazi and Badami bagh bus terminals respectively. Overall results revealed that the $PM_{2.5}$ concentrations were more in Lahore bus terminals as compared to the Peshawar bus terminals. A questionnaire-based survey was conducted to assess the health impacts of $PM_{2.5}$ on people at all proposed bus terminals. The statistical analysis of ANOVA showed a significant (0.05) difference in all the four selected study sites in both the summer and winter seasons.