Abstract:

The air pollutants are being released into the environment due to several anthropogenic activities such as vehicular emissions, industrial and construction processes. The presence of these pollutants into the environment above permissible limits may lead to degradation of ambient air quality and cause many adverse health impacts to humans. The current study was conducted to evaluate and monitor the ambient air quality of Lahore, Pakistan by analyzing air pollutants' levels in the environment and study the health impacts of air pollution by analyzing the data of respiratory diseases. For this purpose, the data was collected by using low volume (Dual Dust) air sampler for both ambient PM_{10} & $PM_{2.5}$. The sampling was done in GC University Lahore. The LVS was kept on roof top of Sustainable Development Study Centre Lahore sufficiently away from disturbances. The data for five respiratory diseases (Asthma, Acute Respiratory Infection, COPD, IHD and Hypertension) was collected from Services & Mayo hospital and statistically analyzed. The results of monitoring indicate that during December for $PM_{2.5}$ (Day) the highest concentration was recorded 1290μg/m^3 while lowest was 400μg/m^3. For $PM_{2.5}$ (Night) the low level concentration was recorded 302μg/m^3 & high concentration was 1287μg/m^3. For PM_{10} (Day) the highest concentration was recorded 1350μg/m^3 & lowest was 379μg/m^3. For PM_{10} (Night) the low level concentration was recorded 440μg/m^3 & high concentration was 1279μg/m^3. During January for $PM_{2.5}$ (Day) the highest concentration was recorded 1245μg/m^3 while lowest was 296μg/m^3. For $PM_{2.5}$ (Night) the lowest concentration was observed 195μg/m^3 & high concentration was 1294μg/m^3. For PM_{10} (Day) the highest concentration was recorded 1292μg/m^3 while lowest was 221μg/m^3. For PM_{10} (Night) the low level concentration was observed 120μg/m^3 & high concentration was 1287μg/m^3. During February for $PM_{2.5}$ (Day) the highest concentration was observed 1225μg/m^3 while lowest was 296μg/m^3. For $PM_{2.5}$ (Night) the lowest concentration was recorded 194μg/m^3 & high concentration was 1267μg/m^3. For PM_{10} (Day) the highest concentration was reached at level of 1155μg/m^3 while lowest was 135μg/m^3. For PM_{10} (Night) the low level concentration was observed 220μg/m^3 & high concentration was 1190μg/m^3. The level of PM was many times higher than the standards as per PEQS by EPA. The data of respiratory diseases collected from services hospital indicates that prevalence of ARI diseases cases was shown greater in winter season. The rise in OPD attendance of acute respiratory infection patient' was 35.52 % in November as compare to lowest during January 2017 & in 2018 the outpatient attendance of acute respiratory infection patients was high during October which was 82% higher as compare to lowest during April. For COPD high

indoor patient attendance was observed during the month of January which was 68.88% high as compare to lowest during the month of April 2017 & in 2018 the indoor attendance of COPD patients was significantly high in May & 68.29% greater as compare to lowest during August. The data of respiratory diseases collected from Mayo hospital indicates i.e. the high inpatient attendance for Asthma was recorded during July which was 43% greater as compare to lowest during March. For Ischemic Heart Disease (IHD) the high inpatient attendance was recorded during November which was 43% greater as compare lowest during July. The significant increase in hospital admission of respiratory patient's number was observed due to increased level of atmospheric particulate matter.