

RELATIONSHIP BETWEEN AIR QUALITY
AND
LUNG FUNCTION OF MIDDLE SCHOOL CHILDREN
IN
URBAN AND SUB-URBAN AREAS OF YANGON CITY

KYI LWIN 00

MASTER OF PUBLIC HEALTH
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Abstract

This cross-sectional study mainly concerned on the major common air pollutant; particulate matter less than 10 micrometer in diameter (PMIO) and total suspended particulate matter (TSPM) at urban and sub-urban areas of Yangon City and relationship with lung functions of the middle school children of these areas. Four schools were selected from downtown of urban area and another four schools were selected from sub-urban area. Total 128 students (67 males and 61 females) from eight schools participated in the study according to inclusion criteria. Ambient particulate matters were measured with a high volume sampler. Mean PMIO of eight areas of Yangon City was 101.98 $\mu\text{g}/\text{m}^3$ with the standard deviation of 59.8 $\mu\text{g}/\text{m}^3$. Mean PMIO of urban areas was 138.7 $\mu\text{g}/\text{m}^3$ and that of suburban areas was 68.56 $\mu\text{g}/\text{m}^3$. Mean TSPM of Yangon City was 200.36 $\mu\text{g}/\text{m}^3$ with the standard deviation of 80.45 $\mu\text{g}/\text{m}^3$. Mean TSPM of urban areas was 266.58 $\mu\text{g}/\text{m}^3$ and that of sub-urban areas was 140.07 $\mu\text{g}/\text{m}^3$. Difference of ambient particulate matters (PMIO and TSPM) between urban and sub-urban area of Yangon City were statistically significant ($p < 0.001$). Mean percentage of predicted forced expired volume in one second (FEV1) of urban was 73.48% and that of sub-urban was 75.99%. Mean percentage of predicted forced vital capacity (FVC) of urban was 67.12% and that of sub-urban was 68.91%. FEV1/FVC ratio of urban was 92.03% and that of sub-urban was 93.54%. Lung function of middle school children from urban and sub-urban areas were not significantly different ($p > 0.05$). Relationship between concentrations of particulate matters and lung functions of school children were not statistically significant. Pearson's coefficients of ambient PMIO and mean percentage of predicted lung function values (FEV1 and FVC) and FEV1/FVC ratio indicate the inverse relationship (-0.387, -0.549, -0.062). Pearson's coefficients of ambient TSPM and mean percentage of predicted lung function values (FEV1, FVC, and PEF) and FEV1/FVC ratio also indicate the inverse relationship (-0.405, -0.259, -0.166, -0.648) respectively. Particulate matters concentrations of both urban and suburban in Yangon City was higher than WHO guideline level and these particulate matters may have an effect on the lung functions of the school children.