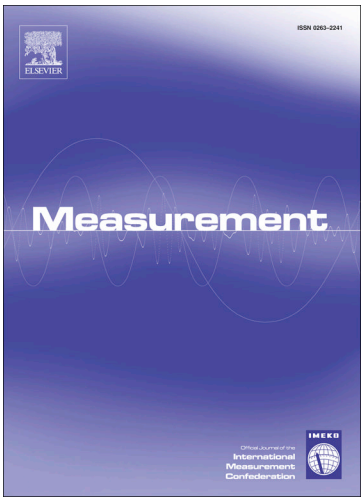

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Risk assessment of particulate matters in a dentistry school using fuzzy inference systems

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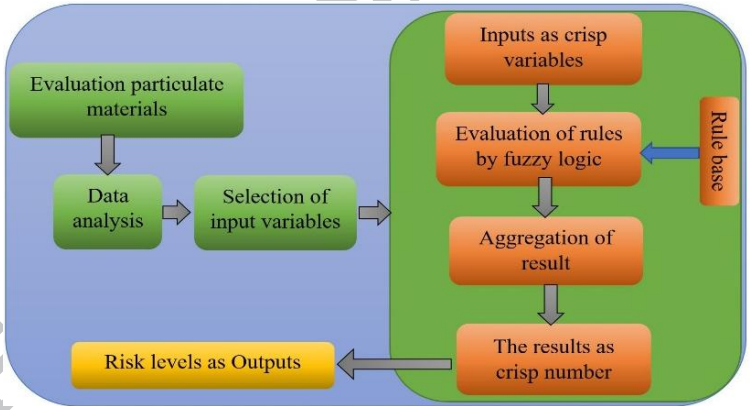
Abstract

The fuzzy logic approach used to estimate the health risk of suspended dust in different parts of a dentistry school. Three input variables, including $PM_{2.5}$, PM_{10} and TSP, and health risk level as the output variable were fuzzed using a fuzzy inference system. Trapezoidal and Triangular membership function were used to graphically defined the outputs (very low, low, moderate, high and very high) in fuzzy sets. The greatest concentrations of particle matters in general orthodontics with 15.9 mg/m3 of TSP and 7.6 mg/m3 of PM_{10} and after which special orthodoxies TSP (13.5 mg/m3) and PM_{10} (7.1 mg/m3) in all the parts. Also, surface graphs illustrated the relationship between $PM_{2.5}$, PM_{10} and TSP. Fuzzy inference system as a novel approach was used for prediction of health risk levels of particulate pollution in dentistry school. Also, this method can be used effectively in other workplace like hospital and health care facilities.

Key words: Fuzzy inference system, dental school, particulate matters, risk assessment



Highlights:

1- Fuzzy approach allows flexible results for prediction of health risk levels of particulate pollution in dentistry school.
2- Surfaces graph shows the impact and relationship between different groups of particulate matters very well.
3- Sensitivity of this approach for particulate matters risk assessment better than standards.
4- The outputs of fuzzy approach are the combination of input variables.

1. Introduction

Most of epidemiological studies show that mineral dust and organic aerosols in the air can emit microorganism and spread infectious diseases [1-4]. Particulate matter such as coarse fraction (higher than 2.5 μm) and fine fraction (less than 2.5 μm) according to their aerodynamic diameter can penetrate into different parts of the respiratory system and into the blood stream [5-7].