

**UNIVERSITI TEKNOLOGI MARA**

**RISK OF TOTAL VOLATILE  
ORGANIC COMPOUND EXPOSURE  
TO AUTO MECHANICS IN PUNCAK  
ALAM**

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Project submitted in fulfillment of the requirements for  
the degree of  
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(Hons.)**

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## DECLARATION BY STUDENT

Project entitled “Risk of Total Volatile Organic Compound Exposure to Auto Mechanics in Puncak Alam” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Dr. Shantakumari A/P Rajan. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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*In the name of Allah, The Most Gracious, The Most Merciful.*

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## ABSTRACT

Auto mechanics do who work in workshops are exposed to Total Volatile Organic Compounds (TVOCs) every day and some of them even did not aware that they are exposed to this contaminant. The main route of TVOCs exposure among auto mechanics are through inhalation as the auto mechanics inhale air contaminated with TVOCs. Exposure of TVOCs for a long period will result in adverse health effects to human especially auto mechanics who work in workshops 8 hours a day. an auto mechanic who exposed to TVOCs for a long period will likely to develop acute respiratory problem, brain and nervous system impairment and inflammation of gastrointestinal system. This cross-sectional study was conducted in Puncak Alam, Selangor which consists of several areas like Puncak Alam Fasa 2, Puncak Alam Fasa 3, Shah Alam 2 and Alam Jaya. About 8 car workshops and 6 motorcycle workshops in these areas are being monitored successfully. The monitoring was conducted for during 8 hours working period. The parameter being measured were TVOCs concentration in workshops and other 2 determinants parameter such as temperature and humidity which were monitored simultaneously. TVOCs concentration was monitored by using ppbRae, whereas determinants parameter like temperature and relative humidity were monitored using Wet Bulb Globe Temperature (WBGT). By using the recorded data, health risk assessment is conducted to find risk level of auto mechanic exposure in workshops. The findings showed that the concentration of TVOCs in motorcycle workshops were significant higher than the concentration of TVOCs in car workshops with mean concentrations of 0.96 ppm and 0.41 ppm. Additionally, the findings also showed that there is no significant correlation between TVOCs concentration and temperature. However, the results proved that there was negative correlation between TVOCs concentration and humidity with p-value <0.001. On the other hand, health risk assessment conducted showed that 3 workshops obtained a hazard quotient value higher than 1 that indicates possible health effects posed by TVOC exposure. Motorcycle workshops showed significant higher TVOCs concentration compared to car workshops. However, it cannot be concluded as a whole yet as there are many determinants which were not assessed in this study. This study also maybe prone to bias from tobacco smoke which did not represent occupational exposure of TVOCs in workshops.

*Keywords: Total Volatile Organic Compounds, Auto mechanic, Workshop, Health Risk Assessment*