



A Review of Health Risk Assessments for Workers at Fuel Stations Exposed to Released Pollutants

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ABSTRACT

Introduction: Fuel stations in urban and rural environments have experienced significant growth. The demand for fuel has increased in response to the increasing number of vehicles on the road. The proximity of fuel stations to roads, combined with vehicle operations occurring within the stations, has led to a notable concentration of volatile organic compounds and suspended particles resulting from incomplete combustion. This study aimed to assess the health risks faced by workers at fuel stations due to the pollutants released.

Methods and Materials: We selected, summarized, and discussed the original research articles from different databases. A total of 59 articles were obtained from 2017 to 2024. All the articles were carefully screened to include only original research articles with an error-free level. The pollutants most commonly produced at fuel stations were evaluated. The quantity and type of these pollutants were compared among fuel stations in Iran, India, and Libya.

Results: This study was conducted in six fuel stations in Karaj, Iran, during summer and winter in 2011. The average occupational exposure to benzene, toluene, ethylene benzene, and xylene during a work shift among all participants in summer and winter was 83.33, 89.33, 202, 210.66, 126.55, 136.83, 168.81, and 174.83 $\mu\text{g}/\text{m}^3$. The findings showed that the carcinogenic and non-carcinogenic risk values in most of the participants are at definite and unacceptable risk levels. In another study, 12 gas stations were selected from different areas of Benghazi in Libya. Pollutant concentrations at most stations were within the Federal Environmental Protection Agency quality standard range. However, the measurement of these pollutants during tank refueling showed a high percentage around the fuel tanks. In another study in Chennai, India, sampling was carried out at a gas station for one week in March 2021. The concentration of suspended particles and volatile pollutants was high in the morning and evening due to the traffic increase on the nearby roads and inside the fuel station.

Conclusion and Discussion: The present investigation reviewed the significant health risks of particulate matter and volatile organic compounds at fuel stations. By comprehensively examining this issue, managers and health and safety professionals can better understand the health risks of fuel stations and take appropriate measures to protect their health and that of their colleagues.

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