UNIVERSITI TEKNOLOGI MARA

EXPOSURE TO CHROMIUM IN USED CRANKCASE OIL AMONG MECHANICS

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BACHELOR IN ENVIRONMENTAL HEALTH AND SAFETY (HONS.)

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Declaration by Student

Project entitled "Exposure to Chromium in Used Crankcase Oil among Mechanics" is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Mr. Mohd Izwan b. Masngut as Project Supervisor and Mr. Ahmad Razali b. Ishak as Co-supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

Student's Signature:

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"In the name of Allah, the Most Gracious and the Most Merciful"

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ABSTRACT

Exposure to Chromium in Used Crankcase Oil among Mechanics

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Introduction: Considerable quantities of heavy metals, such as Lead (Pb), Zinc (Zn), Copper (Cu), Chromium (Cr), Nickel (Ni) and Cadmium (Cd), are contained in used crankcase oil and these metals are highly toxic to organisms. The norm of work as a mechanic was directly dealing with the used oil added with the lack of awareness on personal hygiene amongst mechanics will increase the possibility of heavy metal to be consumed either by ingestion, inhalation or absorption.

Methodology: A cross sectional study was conducted to determine the Chromium (Cr) concentration level in used crankcase oil. This study also intends to determine nails chromium level among the exposed group at the selected auto-workshop. The ex-situ analysis was carried out to determine Chromium in used crankcase oil and nail samples. The analysis was carried out using Fame Atomic Absorption Spectrometry (FAAS). This study aims to associate chromium level in nails to the occupational exposure of used crankcase oil to mechanics. The samples were taken from 3 auto-mechanic workshop around Gombak. Respondents that participated in this study were mechanics. A total of 15 mechanics (n=15) were participated in this study. The controlled group consists of 15 people (n=15) whose working in the workshops but do not handling crankcase oil such as clerk, people who frequently visited the workshops and people who live nearby study location.

Results: Result shows the presence of chromium in used crankcase oil taken from 3 auto workshops in Kampung Kerdas and the presence of chromium in nails of exposed and non-exposed group. Chromium concentration in nails of exposed group is higher than in non-exposed group. Mean value of chromium in 15 nail samples of exposed group is 35.61 mg/kg with standard deviation of 28.941. The data distribution is normal because of p-value is <0.05 for normality test whereas mean value of chromium in 15 nail samples of non-exposed group is 4.55 mg/kg with standard deviation of 1.972. There is significant difference of chromium concentration in nails between exposed and non-exposed group p-value is 0.000. Chromium concentration in nails between exposed and non-exposed group was significantly different ($p<0.05$) by comparing mean using t-test.

Conclusion: It is concluded that Chromium is present in used crankcase oil and highest detection in nails of exposed group. Lacking in awareness and knowledge among the mechanics increasing the risk exposure to their health. Over years, this negligence may take their tolls as in the case of Extramammary Paget Disease has proven for continuous exposure to used crankcase oil.

Keywords: *Crankcase oil, Chromium (Cr), Extramammary Paget Disease, mechanics, biomonitoring*