

**ASSOCIATION OF BLOOD LEAD LEVELS AND WORKING
MEMORY ABILITY OF PRIMARY SCHOOL CHILDREN IN
RANAU, SABAH**

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2015**



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ABSTRACT

A cross sectional study on the association of Blood Lead Levels (BLL) and Working Memory (WM) ability of primary school children in Ranau, Sabah was conducted from September 2012 till October 2013 . One hundred schools children were selected from 5 schools which consisted of three from Ranau (Study Population, n=50), one each from Pitas and Sipitang (Control Population, n=50). The objectives were to study the association of BLL and WM ability of Primary School Children in Ranau Sabah, to identify the difference in BLL and WM Ability between sex and type of populations, the correlation between respondent background and BLL's, to determine the level of WM ability and the correlation of BLL and WM. Blood samples were taken by venous blood draw using disposable syringes and collected in plastic sterile tube mixed with K₂EDTA. The samples were maintained at 4°C and transported to Universiti Malaysia Sabah laboratory. BLL was tested using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) Perkin-Elmer. WM ability was measured by extraction of McCarthy Intelligent Quotient (IQ) Index Test and known as WM Index Cumulative Score (WMICS). Demographic background obtained from the distributed questionnaires. One sample T Test show, p-value > 0.05 for BLL at 4.90 µg/dL - 5.28 µg/dL lower than BLL for 'action level' at 10 µg/dL (ATSDR, 2007). The independent Samples T test of mean show BLL was higher in boys compared to girls (p < 0.05), no significant difference between the study population and control population (p > 0.05). ANOVA tests for BLL and race/ethnicity (p > 0.05), BLL and mode of transportation to school (p >0.05), BLL and religion (p > 0.05), BLL and education level (p > 0.05). The WM ability of school children was high, 76% scored 78% -100% of WMICS. Mann Whitney U Test show type of populations influenced the WMICS (p < 0.05) but not gender (p > 0.05). Pearson Correlation Test show a negative association for BLL and WMICS (r= -0.621) at medium level where r = (-0.51) – (-0.70)). The research result was a reinstatement of negative associations of BLL and WM ability among school children. However, since the study results are not considered representing the whole problem of BLL of school children in Sabah. Further research is needed such as to carry out a comprehensive and complete lead study and monitoring programme which involves all areas and parameters, such as age, environmental samples, biomarkers, nutritional factors, KAP's and complete IQ test together with continuous health promotion and education programmes with inter-agency collaboration. Such comprehensive programme will ensure the lead elimination programme become a reality in Sabah.