

# Association between HbA1c with lifestyle, health & demographic factors among people in Penang, Malaysia

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## ABSTRACT

**Introduction:** The definitive link between diabetes risk factors and glycosylated haemoglobin (HbA1c) level is unclear. We aimed to compare the mean of HbA1c between healthy and diabetic patients in Penang across several factors. **Methods:** A total of 211 healthy and 198 diabetic patients aged  $\geq 30$  years were purposively sampled across general hospitals, health clinics, and community centres in Penang between February 2016 and January 2018. **Results:** The association between HbA1c and age, gender, family history of diabetes, smoking and alcohol consumption was conducted using an independent t test. HbA1c levels in older patients ( $>60$  years) were significantly lower (mean=7.60) than in younger diabetic patients ( $<60$  years) (mean=8.51) ( $p=0.001$ ). In diabetic patients, those who consumed alcohol had lower HbA1c (mean=7.54) compared to those who never consumed alcohol (mean=7.54) ( $p=0.001$ ). In healthy population, HbA1c was significantly lower in younger aged group (mean=5.63) compared to elderly (mean=5.80) ( $p=0.001$ ). One-way ANOVA and Post-Hoc tests were used to analyse the comparison of HbA1c among different ethnicities and Body Mass Index (BMI) categories. For ethnicity, the healthy population showed significantly lower HbA1c in Malays (mean=5.58) and the highest in Indians (mean=5.84) ( $p=0.001$ ). Among diabetic patients, Indians showed significantly higher HbA1c (mean=8.99) than Chinese (mean=7.17) ( $p<0.001$ ). There are significant differences in the healthy population between the underweight (mean=5.57) and obese (mean=5.99) populations ( $p=0.018$ ). **Conclusion:** HbA1c was associated with age, ethnicity, and BMI in the healthy population. In diabetic patients, it was associated with age, ethnicity, and alcohol consumption. Health screening should concentrate more on populations with risk factors.