Factors Associated with Diabetes Complications among People with Type 2 Diabetes in Sabah, Malaysia: A Cross-Sectional Study

Introduction

The rising prevalence of type 2 diabetes (T2D) and diabetes complication result in substantial healthcare expenses, particularly given the considerable government subsidies provided to the healthcare system in Malaysia [1]. It is essential to periodically research diabetes complications and related variables to identify evolving trends and devise a plan of action. The objective of this study was to determine the prevalence and factors associated with diabetes complications among people with T2D in Sabah, Malaysia.

Methods

This cross-sectional study was carried out at six primary healthcare clinics in Kota Kinabalu and Penampang areas in West Coast Division, Sabah from April 2023 to July 2023. A total of 287 patients with sub-optimally controlled T2D (HbA1c > 6.5%) who met inclusion criteria (diagnosed with T2D, ≥ 18 years old, on T2D medications and HbA1c > 6.5%) and provided written consent were included in the analysis. Demographic and medical data were obtained from the patients’ medical records. This study received ethical approval from the Ministry of Health Malaysia’s Medical Review and Ethics Committee (ethical approval: NMRR-ID-23-0097-XP1(IIR)).

The diabetes complication in this study refers to having at least one of the diabetes-related complications that had been identified by physicians and recorded in patients’ medical records, which include retinopathy, stroke, ischemic heart disease, nephropathy, and diabetes-related foot problems. The definition of diabetes complications in this study was in line with the latest Sixth Clinical Practice Guidelines for the Management of Type 2 Diabetes Mellitus by the Ministry of Health Malaysia [2].
Multiple logistic regression models were used to estimate odds ratio (OR) and 95% confidence interval (CI) for diabetes complications using SPSS version 28.

### Results

Trained medical officers identified and briefed 420 potential eligible study participants who attended the participating healthcare clinics about taking part in this study. One hundred thirty-three individuals were excluded who refused to participate in the study or did not meet the criteria. A total of 287 participants with T2D were included in this study (mean age = 53.31 years, female = 54.4%, mean diabetes duration = 6.23 years). The prevalence of diabetes complications was 12.9%. Most participants were Dusun-Kadazan ethnicity (41.1%), with education level of secondary and below (96.5%), and overweight [mean body mass index (BMI) = 29.65]. Age (OR = 1.044, 95% CI: 1.003–1.087), unmarried (OR = 2.674, 95% CI: 1.174–6.092), diabetes duration (OR = 1.065, 95% CI: 1.002–1.132) and polypharmacy (OR = 4.612, 95% CI: 1.637–12.997) were associated with increased risk of diabetes complications (Tab. 1) after adjusting for age, marital status, diabetes duration and polypharmacy.

### Discussion

Factors associated with diabetes complications among people with T2D is age, unmarried status, diabetes duration and polypharmacy. The findings of this study are comparable to other studies [3, 4]. Similarly, a study done in China documented that the odds of vascular complications was higher in unmarried patients than in married patients (OR = 1.41, 95% CI: 1.12–1.77) [3]. This information could be useful in developing methods for managing and preventing diabetes complications such as an effective intervention to improve glycemic control incorporating health education on self-care management.

The limitations of this study include small sample size, and due to the nature of the cross-sectional study, the findings may not be generalizable and not suitable to examine cause-and-effect relationships.

### Article information

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#### Conflict of interest

The authors declare no conflict of interest.

### REFERENCES