

ASSOCIATED WITH LOSS TO FOLLOW-UP AMONG TYPE 2 DIABETES PATIENTS ATTENDING PUBLIC HEALTH CLINICS IN NEGERI SEMBILAN, MALAYSIA



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NMRR 18-2731-44032 (IIR)



INTRODUCTION

Although diabetes is highly prevalent in Malaysia and public health facilities are the main care provider, information on the loss to follow-up (LTFU) of diabetes patients in routine care is scarce. Understanding LTFU is essential to improve the quality of care and clinic efficiency.

OBJECTIVE

We aimed to determine the prevalence and factors associated with LTFU among type 2 diabetes patients attending public health clinics in Negeri Sembilan, Malaysia.

METHODS

A five-year retrospective open cohort study was conducted using National Diabetes Registry data from 2013 to 2017. The study setting was all 47 public health clinics in Negeri Sembilan. Independent variables were measured at the study baseline, and **LTFU** was defined as non-attendance to clinics for ≥ 1 year. The diabetes treatment goals were HbA1c $< 7.0\%$, blood pressure $< 130/80 \text{ mmHg}$, and LDL-cholesterol $< 2.6 \text{ mmol/L}$. Multivariate proportional hazards modelling was conducted to determine the factors associated with LTFU.

RESULTS

Among 18,341 patients, there were more females (55.8%), Malays (64.7%), and older patients ≥ 60 years (49.4%). The mean follow-up duration was 2.5 ± 1.1 person-years, and 4.6% (95% CI: 4.3–4.9%) of patients had LTFU.

Older age groups, females, Chinese ethnicity, overweight patients, and those with dyslipidaemia were less likely to LTFU (Table 1). Patients on more intense diabetic and hypertension treatment regimens and those who achieved more treatment goals were also less likely to LTFU.

Table 1: Factors associated with loss to follow-up, n = 17,485

Characteristics	Adjusted hazard ratios	95% confidence intervals	P values
Age groups, years			
<45	1.00		
45 – 59	0.57	0.44 – 0.72	<0.001
60 and above	0.78	0.61 – 0.99	0.042
Sex			
Males	1.00		
Females	0.76	0.66 – 0.88	<0.001
Ethnic groups			
Malay	1.00		
Chinese	0.79	0.64 – 0.97	0.024
Indian	0.86	0.71 – 1.04	0.123
Others	1.93	0.95 – 3.88	0.067
Body mass index categories			
Underweight, $< 18.5 \text{ kg/m}^2$	1.32	0.77 – 2.28	0.308
Normal, $18.5 – 24.9 \text{ kg/m}^2$	1.00		
Overweight, $25.0 – 29.9 \text{ kg/m}^2$	0.80	0.67 – 0.95	0.010
Obese, $\geq 30.0 \text{ kg/m}^2$	0.83	0.69 – 1.00	0.054
Dyslipidaemia			
	0.83	0.70 – 0.97	0.023
Diabetes treatment modality			
Lifestyle modification only	1.00		
Oral hypoglycaemic agents only	0.51	0.36 – 0.72	<0.001
Insulin only	0.58	0.38 – 0.89	0.013
OHA and insulin	0.47	0.32 – 0.68	<0.001
Number of antihypertensive agents			
None	1.00		
One	0.66	0.54 – 0.82	<0.001
Two	0.76	0.62 – 0.93	0.008
\geq Three	0.87	0.70 – 1.08	0.218
Number of treatment targets achieved			
None	1.00		
One	0.74	0.63 – 0.88	<0.001
Two	0.74	0.61 – 0.91	0.003
Three	0.71	0.49 – 1.03	0.072

DISCUSSION & CONCLUSION

The prevalence of LTFU was comparable to the 5.4% reported nationwide in 2009, implying the relatively constant LTFU issue among T2D patients in Malaysia. The prevalence fell within the lower range of 4% to 18% reported elsewhere.

T2D patients with more comorbidities (e.g., overweight, dyslipidaemia) and more serious conditions (e.g., insulin use, more antihypertensive agents) were less likely to LTFU, possibly due to increased self-perceived severity or better health knowledge. Better achievement of diabetes treatment goals might improve the perceived benefits of treatment, causing less LTFU.

Certain demographics, such as younger adults and males, can be targeted for interventions to reduce LTFU in public health clinics. Appropriate use of pharmacological agents and the achievement of diabetes treatment goals are important as they may improve LTFU in diabetes care in Malaysia.



841 or 4.6% of patients had LTFU over a follow-up duration of 2.5 person-years.



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ACKNOWLEDGMENT

We thank the Director-General of Health Malaysia for the permission to publish this poster.