



Prevalence of Diabetes and its Associated Factors Among the Malaysian Adults Population: National Health and Morbidity Survey 2019



Hasimah Ismail, Wan Shakira Rodzlan Hasani, Thamil Arasu Saminthan, Halizah Mat Rifin, Nur Liana Ab Majid, Ahzairin Ahmad, Tania Gayle Robert Lourdes, Jane Ling Miaw Yn, Muhammad Fadhli Mohd Yusoff, Tahir Aris, Noor Ani Ahmad

Institute for Public Health, MOH

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Introduction

Diabetes is a major non-communicable health problem in both developed and developing countries, including Malaysia.

Person with diabetes are living longer and are vulnerable to microvascular and macrovascular complications thus representing an important public health problem with high morbidity, mortality and significant economic repercussions.

Objective

To determine the national prevalence of diabetes and to identify associated factors among adults population in Malaysia.

Methodology

A nationwide cross-sectional study was conducted in 2019 involving 10,464 respondents in Malaysia.

Two-stage stratified sampling design was used to select a representative sample of Malaysia adults population.

Structured validated questionnaire with face-to-face interview were used to obtain data from selected respondents aged ≥ 18 years.

Finger pricked fasting blood glucose test by using Accutrend GC machine were performed on respondents who claimed that they were not having diabetes.

Chi-square tests and logistic regression were used to determine associations between diabetes and associated factors at the significance level of $=0.05$.

For the purpose of this study, a respondent was classified as having "diabetes" when the respondent had a fasting capillary blood glucose (FBG) of ≥ 7.0 mmol/L (or non-fasting capillary blood glucose of ≥ 11.1 mmol/L).

Results

The overall prevalence of diabetes among adults respondents was 18.3% ($n=2629$).

The highest prevalence of diabetes were among females (18.4%), aged 60 & above (41.5%) Indian (31.4%), those without formal education (28.7%), widow/widower/divorcee (33.2%), not working (24.9%), inactive (22.5%), obese (27.1%), hypertension (36.0%) and high cholesterol level (30.4%).

Logistic regression analyses revealed that age group, ethnicity, education level, marital status, physical activity level, obesity, blood pressure status and cholesterol status were associated with diabetes among adults.

Discussion

This study showed the prevalence of diabetes among adults Malaysian population at 18.3%.

Our study recorded a relatively higher level of diabetes among adults population as compared to 7.5% in Brazil (Luisa SF and Monica RC) but lower than Majmaah, Arab Saudi at 34.6% (Mohammed Abdullah AM)

There were significant associations between diabetes with age groups, ethnicity and education level, marital status, physical activity which concurred with findings from Alemayehu Z et. al. and Meiqin Hu et. al.

Our study also showed there were significant associations between diabetes with obesity, hypertension and cholesterol. Similar findings were reported by Wan Nazaimoon WM et al. and Shiferaw BA & Ayalew JZ.

However, no significant association was found in gender, residence and occupational status.

Conclusion

This study showed that the prevalence of diabetes among adults populations in Malaysia to be high, with one in five persons found to have diabetes.

This study also found that established risk factors like age group, ethnicity, education, physical activity, obesity, hypertension and cholesterol were associated with diabetes.

Awareness program and interventions on diabetes need to be improved especially related to behavioural change as a strategy for prevention and control of diabetes and its complications.

References

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Prevalence, Awareness and Associated Risk Factors of Diabetes among Adults in Xi'an, China. Meiqin Hu 1,2, Yi Wan 3, Lifan Yu 1,2, Jing Yuan 1, Yonghong Ma 1, Bin Hou 2, Xun Jiang 4 & Lei Shang. *Scientific Reports* | 7: 10472 | DOI:10.1038/s41598-017-10797-x

Table 1 Prevalence of diabetes by socio-demographic characteristics

Demographic Characteristics	Diabetes			
	count	Prevalence (%)	Lower % (95 CI)	Upper
National	2629	18.3	17.08	19.58
Gender				
Male	1191	18.2	16.63	19.90
Female	1438	18.4	16.99	19.89
Age group				
18-39	438	8.4	7.16	9.75
40-59	1129	25.3	23.27	27.47
60 & above	1062	41.5	38.54	44.55
Residence				
Urban	1519	18.3	16.8	19.8
Rural	1110	18.3	16.48	20.4
Ethnic group				
Malay	1868	21.6	20.02	23.17
Chinese	276	15.1	25.85	37.53
Indian	250	31.4	25.85	37.53
Other indigenous	160	11.6	9.15	14.62
Others	75	8.8	6.21	12.21
Education level				
No formal education	231	28.7	23.10	34.94
Primary school education	795	23.9	21.14	26.98
Secondary school education	1196	18.1	16.59	19.77
Tertiary education	399	12.7	10.76	14.85
Unclassified	3	4.8	1.21	17.18
Marital status				
Single	195	7.7	6.27	9.53
Married	1975	21.3	19.74	22.94
Widow/widower/divorcee	459	33.2	29.27	37.30
Occupation status				
Working	1166	14.5	13.06	16.01
Not working	1461	24.9	23.23	26.65
Physical activity				
Active	1799	16.8	15.49	18.23
Inactive	796	22.5	20.26	24.81
Obesity				
Non Obese	1702	16.0	14.76	17.38
Obese	747	27.1	24.31	30.05
Blood pressure status				
Normotensive	916	10.7	9.54	12.04
Hypertensive	1713	36.0	33.84	38.16
Cholesterol status				
Normal cholesterol	839	10.9	9.62	12.22
High cholesterol	1790	30.4	28.48	32.42

Table 2: Factors associations with diabetes (using multiple logistic regression)

Risk Factors	Simple Logistic Regression		Multiple Logistic Regression	
	Crude OR (95% CI)	p-value	Adjusted OR* (95% CI)	p-value
Gender				
Male	1.00	-	-	-
Female	1.02 (0.94, 1.12)	0.629	-	-
Age group				
18-39	1.00	-	-	-
40-59	3.99 (3.45, 4.40)	<0.001	1.95 (1.68, 2.27)	<0.001
60 & above	6.76 (5.96, 7.68)	<0.001	2.68 (2.23, 3.20)	<0.001
Residence				
Rural	1.19 (1.09, 1.31)	<0.001	-	-
Urban	1.00	-	-	-
Ethnic group				
Chinese	1.00	-	-	-
Malays	1.45 (1.25, 1.67)	<0.001	1.77 (1.50, 2.09)	<0.001
Indians	2.31 (1.88, 2.84)	<0.001	3.02 (2.38, 3.83)	<0.001
Other Bumiputra	0.66 (0.54, 0.82)	<0.001	0.82 (0.64, 1.04)	0.103
Others	0.53 (0.40, 0.70)	<0.001	0.92 (0.68, 1.26)	0.616
Education level				
No formal education	2.84 (2.34, 3.45)	<0.001	1.37 (1.07, 1.76)	0.012
Primary education	2.55 (2.22, 2.93)	<0.001	1.18 (0.99, 1.40)	0.061
Secondary education	1.61 (1.42, 1.83)	<0.001	1.20 (1.04, 1.38)	0.012
Tertiary education	1.00	-	-	-
Marital status				
Single	1.00	-	-	-
Married	3.89 (3.33, 4.54)	<0.001	1.79 (1.49, 2.16)	<0.001
Widow/widower/divorced	6.95 (5.75, 8.39)	<0.001	1.83 (1.45, 2.31)	<0.001
Occupation status				
Working	1.00	-	-	-
Not working	1.96 (1.79, 2.14)	<0.001	-	-
Physical activity level				
Active	1.00	-	-	-
Inactive	1.39 (1.26, 1.54)	<0.001	1.21 (1.07, 1.36)	0.002
Obesity				
Non Obese	1.00	-	-	-
Obese	1.86 (1.68, 2.07)	<0.001	1.63 (1.45, 1.83)	<0.001
Blood pressure status				
Hypertensive	4.38 (3.99, 4.81)	<0.001	2.19 (1.95, 2.45)	<0.001
Normotensive	1.00	-	-	-
Cholesterol status				
Normal cholesterol	1.00	-	-	-
High cholesterol	3.40 (3.10, 3.74)	<0.001	1.93 (1.73, 2.15)	<0.001

*Backward likelihood ratio multiple logistic regression as a applied Multicollinearity and interaction were check and not found-Hosmer lame show test $p=0.074$. classification table coverall correctly classified percentage 76.9% and receiver operating characteristic (ROC) curve = 77.0% were accepted to check model fitness.

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