

Factors of Diabetes Among Senior Citizens in Malaysia

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ABSTRACT

This study is about the factors of diabetes among senior citizens in Malaysia. Diabetes is a chronic disease whose effects can be seen over a long period of time, influenced by the way the body converts food into energy. Researchers found several factors that are often associated with diabetes, namely age, lifestyle, and heredity. This study was to identify the relationship between genetic factors that cause diabetes among senior citizens in Malaysia. Next, to investigate the relationship between lifestyle factors that caused diabetes among senior citizens in Malaysia and also examine the relationship between environmental factors that caused diabetes among senior citizens in Malaysia. This study was conducted using a quantitative approach to measure the genetics, lifestyle and environment that caused an increase in diabetes disease among senior citizens in Malaysia. A total of 400 respondents have participated in this study. Based on findings and implications, the most significant factor was genetic, which achieved the highest mean score of 50.3%, which was female.

Keyword: Diabetes, Genetic, Lifestyle, Environment, Senior Citizens in Malaysia

INTRODUCTION

Diabetes happens when the body is not able to take up sugar (glucose) into its cells and use it for energy. This results in a buildup of extra sugar in the bloodstream. Poorly controlled diabetes can lead to serious consequences, causing damage to a wide range of the body organs and tissues, including the heart, kidneys, eyes and nerves. Diabetes is a disease that is dangerous to everyone regardless of age. Therefore, the disease is also common in the elderly. This is because most senior citizens do not take care of their health, especially in terms of nutrition (Cleveland Clinic Medical Professional, 2021).

According to the enrollment data set, there are 1,614,363, who have been patients registered at the NDR, which is 99.3% of whom have type 2 diabetes. The average age of type 2 diabetes patients in the NDR is 63 years, and the average age at diagnosis for type 2 diabetes patients was 53 years. Most people with diabetes are women (57.1%) and Malay (59.2%). In 2019, there were 897,421 severely diabetic patients at the NDR (National Diabetes Registry Report, 2019).

The aim of this study was to identify factors of diabetes among senior citizens in Malaysia. There are three objectives in this research:

To identify the relationship between genetics as a factor that causes diabetes among senior citizens in Malaysia.

To investigate the relationship between lifestyles as a factor that causes diabetes among senior citizens in Malaysia.

To determine the relationship between the environment as a factor that causes diabetes among senior citizens in Malaysia.

Significance of Study

Every study conducted has a specific reason to be used as an authentic reference material. Thus, the motivation behind this review is directed to identify the elements that can cause diabetes among the elderly in Malaysia. Thus, this study could help the elderly to find out the cause of their diabetes. This is because, most likely diabetic factors such as unhealthy lifestyle factors can also be a factor in an individual suffering from other diseases. Adopting an unhealthy lifestyle can not only lead to diabetes, but it can also lead to an individual's potential to become obese. Therefore, this study is not only useful for diabetics, but it is also very useful as a reference for people with other diseases.

LITERATURE REVIEW

Genetic

Genetics is among the major factors in inheritance and variation in all living things, including humans and microorganisms. Chromosomes, which are made up of DNA and protein molecules called histones, store genetic information in living things. Therefore, genetics is a natural thing that cannot be changed by humans, even if it has a negative or positive impact on human life. Genetics-related matters that are often a major issue are the risk of hereditary diseases that exist as a result of genetic problems faced by parents that will be inherited by the unborn child. One of the hereditary diseases caused by genetic factors is diabetes or better known as diabetes mellitus. Suspected susceptibility genes may hold the key to the development of diabetes. One of the most common chronic disorders in children is type 1 diabetes mellitus (Radha et al., 2003).

Lifestyle

Lifestyle can be defined as the way of life of an individual or a group of people. People in different societies have different lifestyles. Most people in Malaysia, especially the elderly, are very fond of consuming foods that contain excess fat, whether saturated or unsaturated fat. In animal experiments, the use of saturated, monounsaturated and polyunsaturated fatty acids, with the exception of n-3 fatty acids, resulted in insulin resistance when a high-fat diet was taken (Steyn et al., 2004). This will negatively impact an individual suffering from diabetes, especially the elderly who are a group with great potential to suffer from it. Therefore, Type 2 diabetes is clearly associated with an inactive lifestyle and poor diet (Moore et al., 2011).

Environment

The environment is thought to be influenced by genetic factors in the development of diabetes mellitus (Adeghate et al., 2006). A bad environment will trigger various types of diseases like diabetes and will cause health problems. In the pathogenesis of diabetes, environmental variables play a role. Contaminated water, soil, stress, retrovirus exposure, and immune cell destruction are all examples of environmental influences (Raman, 2016). Furthermore, air pollution has been linked to poor glucose metabolism, insulin resistance (IR), and type 2 diabetes mellitus in a recent investigation (Pearson et al., 2010); (Kramer et al., 2010).

Diabetes

The International Diabetes Federation recommends that the reasons for the development of diabetes are population maturity and unwanted lifestyle practices. Some of these unfortunate lifestyle practices include being completely inactive, smoking, drinking alcohol, and following an unwanted diet regimen.

After adjusting for common hazard factors, we found that independently consolidated lifestyle behaviors were associated with mortality and morbidity from diabetes, cardiovascular infection, and malignant growth (Cheng et al., 2012). In some cases, diabetic patients caused

by mutations in the genetic factor of hepatocyte nuclear factor 1 (HNF-1) have been described as sensitive to the hypoglycemic effects of sulfonylureas (Pearson et al., 2003). Insulin-subordinate (IDD) and non-insulin-subordinate diabetes (NIDD) are discrete issues

Research Hypothesis

In this study, the three-hypothesis tested were:

- H1: There is a significant relationship between genetic factors that cause diabetes among the senior citizens in Malaysia
- H2: There is a significant relationship between lifestyles factor that cause diabetes among the senior citizens in Malaysia
- H3: There is a significant relationship between environmental factors that cause diabetes among the senior citizens in Malaysia

Research Framework

Figure 1 below shows the research framework used in this research.

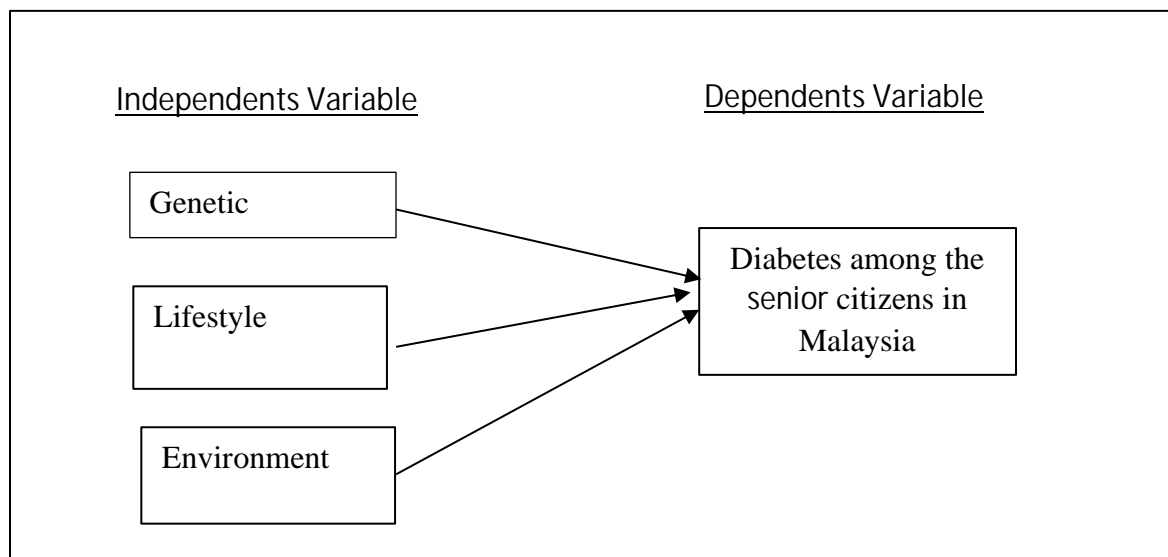


Figure 1: Research Framework

METHODOLOGY

Research Design

This study used a quantitative method to gain data through the questionnaire in Google Forms. The questionnaire consisted of 4 parts of 20 items. Part A was about demographic respondents, and parts B, C and D were about independent variables and dependent variables. Questionnaires were used to obtain diabetic patients in Malaysia who were caused by genetic, lifestyle and environmental factors.

Data Collection

In this study, Google Forms was used for data collection that was created as a questionnaire to collect data. The questionnaire was distributed to 400 respondents in this study. Respondents were also selected randomly to answer the question factor of diabetes among senior citizens in Malaysia.

Sampling

The probability sampling technique was the sampling method that was used in this research. To represent the entire data set, a simple random sample was taken in a small random portion of the entire population, in which each member had an equal chance of being selected.

Data Analysis

This study used two data analysis, which were descriptive analysis and Pearson correlation analysis. The collected data were analysed by using Statistical Package for the Social Sciences (SPSS) to get the statistics on the relationship between independent variables and dependent variables.

FINDINGS

Results of Frequency Analysis

Table 1 below shows the frequency analysis of this research.

Table 1: Respondents' Profile (n=400)

Characteristics	Frequency (N)	Percentage (%)
Gender		
Male	199	49.8
Female	201	50.3
Age		
18-27 years	42	10.5
28-37 years	39	9.8
38-47 years	104	26.0
Above 48 years	215	53.8
Status		
Married	240	60.0
Single	60	15.0
Divorced	100	25.0
Employment status		
Student	27	6.8
Self-employed	135	33.8
Employed	188	47.0
Unemployed	50	12.5

Table 1 depicts the profile of the respondents. Out of 400 respondents, the majority of the respondents were females, which accounted for 50.3% of the total sample. In terms of the respondents' age, 10.5% of them were 18 to 27 years old, 9.8% were 28 to 37 years old, 26.0% were 38 to 47 years old, and 53.8% were 48 and above. Meanwhile, in terms of status, most of the respondents were "Married" with 60%, followed by divorced with 25%, and single with 15.0%. As for the employment status, out of 27 respondents recorded, 6.8% of the respondents were students, 33.8% were self-employed, 47.9% were employed, and 12.5% of them were unemployed. The statistics nearly represent the actual demographic tabulation with regard to the factor of diabetes among senior citizens in Malaysia.

Results of Descriptive Analysis

Table 2 below shows the result of descriptive analysis of this research.

Table 2: Results of Descriptive Analysis

Variables	Item	Main Score	Standard Division
Genetic	Do you have a family history of diabetes?	1.36	0.481
	Through the consanguinity of whom that have diabetes?	2.63	1.404
	If your family has diabetes. What types of diabetes they have?	1.80	0.828
	Does your family that have other diseases as well which can cause diabetes?	1.36	0.481
	Is your family's overweight the cause of diabetes?		
Lifestyle	What kind of daily physical activity do you do every day?	2.16	0.71
	Do you check blood sugar levels with care and attention?	1.43	0.49
	Do the foods that you choose to eat make it easier to achieve optimal blood sugar levels?	1.51	0.50
	Do you do regular physical activity to achieve optimal blood sugar levels?	1.6	0.49
	Is your diabetes self-care being poor?	1.52	0.50
Environment	Is your environment prone to smoking activities?	1.28	1.45
	Does your environment exhibit a healthy influence on you such as the influence of healthy lifestyle practices?	1.51	1.5
	Is your environment prone to infection?	1.53	1.5
	Is your environment equipped with health infrastructure facilities such as hospitals or clinics?	1.15	1.35
	Is your environment equipped with facilities for obtaining information on diabetes control such as diabetes education programs?	1.48	1.5
Diabetes among Senior Citizens	How often do you worry about that your body looks different because have diabetes?	2.94	1.11
	How often do you worry about that you had to not go to work?	2.47	1.12
	How often do you worry about that you will not be allowed to take insurance?	2.31	1.23
	How often do you worry about getting complications as a result of your diabetes?	2.90	1.17
	Compared to other people your age, do you consider your health?	2.71	0.8

Results of Reliability Analysis

Table 3 shows the results of liability diabetes among senior citizens for the variables.

Table 3: Reliability Analysis

Variable	Number of Items	Cronbach's Alpha
Diabetes	5	0.864
Genetic	5	0.687
Lifestyle	5	0.414
Environment	5	0.125

Table 3 presents the Cronbach's Alpha values of the questionnaire, which were in the range of very good level (0.125) to excellent level (0.864). A total number of five independent variables were tested using Cronbach's Alpha. The dependent variables were diabetes which showed excellent levels and reliability in the strength of Correlation (5 items: $\alpha = 0.864$). Then, the first independent variable was genetic, which shows the second excellent level, which is (5 items: $\alpha = 0.687$). Besides, the second independent variable that was in a very good position was lifestyle, which was (5 items: $\alpha = 0.414$). The last one was the third independent variable which was the environmental factor, that was in a good position which was recorded (5 items: $\alpha = 0.125$). Therefore, the data were considered suitable for further analysis.

Results of Pearson Correlation Analysis

Table 4 below shows the result of correlation analysis of this research.

Table 4: Pearson correlation analysis

Hypothesis	Place Value	Result (Supported/ Not Supported)
H1: There is a significant relationship between genetic factor that cause diabetes among the senior citizens in Malaysia	-0.317	Not Supported
H2: There is a significant relationship between lifestyles factor that cause diabetes among the senior citizens in Malaysia	0.405	Supported
H3: There is a significant relationship between environment factor that cause diabetes among the senior citizens in Malaysia	0.204	Supported

Table 4 shows that genetic factors that caused diabetes among the senior citizens in Malaysia had a significant correlation at $r = -0.317$, $p < 0.01$. This shows a negative relationship between genetic factors that caused diabetes among the senior citizens in Malaysia. There was a statistically significant correlation between lifestyle factors that caused diabetes among senior citizens in Malaysia, with $r = 0.405$, $p < 0.01$. This shows a positive relationship between lifestyle factors that caused diabetes among senior citizens in Malaysia. There was a statistically significant correlation between environmental factors that caused diabetes among the senior citizens in Malaysia, with $r = 0.204$, $p < 0.01$. This shows a positive relationship between environmental factors that caused diabetes among senior citizens in Malaysia. The result for hypothesis 1 (H1) were accepted at a 0.01 significance level. Next, the results for hypothesis 2

(H2) and hypothesis 3 (H3) were accepted at a 0.01 significance level, according to the results.

DISCUSSION & RECOMMENDATIONS

In this study, there were several recommendations. This study only focused on the factor of diabetes among senior citizens in Malaysia. In addition, for further proposals to prevent diabetes in children in one state can also be made for future studies. In addition, conducting diabetes prevention programs among the elderly and also all people with type 2 diabetes can help them to maintain better health. This is because the Diabetes Prevention Program (DPP) suggests that both medications and lifestyle interventions can slow or prevent the progression from impaired glucose tolerance (IGT) to type 2 (1) diabetes. DPP showed that compared to placebo intervention, intensive lifestyle intervention reduced the incidence of type 2 diabetes by 58% and metformin intervention reduced the incidence of type 2 diabetes by 31% over a period of 2.8 years (William et al., 2003). The next recommendation is regarding the senior citizens, or everyone with type 1 diabetes can also prevent it. Prevention of type 1 diabetes mellitus (T1DM), based on the prevention of islet β cell destruction, can be considered at different stages of the disease, from the stage before or after the onset of hyperglycemia. Antigen-specific therapy, the most widely studied antigens used in tests for the prevention of immunological β -cell destruction were insulin and GAD (Li Zhang et al., 2011). Based on the findings, it was found that these three factors had caused diabetes among senior citizens in Malaysia. The suggestion for future researchers was about studying the diabetes prevention in children and focus on one state. Researchers also recommended that the elderly should always practice a healthy lifestyle and make prevention and early treatment if they experience symptoms of diabetes.

CONCLUSION

In conclusion, this study has been accomplished to discover factors of diabetes among senior citizens in Malaysia. Three independent variables, namely genetic, lifestyle, and environmental, have been chosen to examine their relationships with the dependent variables, which were the diabetes factors among senior citizens in Malaysia.

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