

Type 2 diabetes mellitus study based on patient characteristics in Puskesmas Wiradesa

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Abstract

Background: The Silent Killer is the name of diabetes mellitus because this disease has a major impact on the body's organs, causing various complaints in the body (Sarifah and Siyam, 2023). Diabetes mellitus (DM) is a chronic disease that occurs when the pancreas cannot produce enough insulin in the body so that the insulin produced in the body is ineffective. According to the Pekalongan Health Office, the highest prevalence of Wiradesa Health Center is 715 DM patients with various characteristics, namely age, gender, weight and occupation respectively. **Objectives of the study:** The purpose of this study was to assess Type 2 Diabetes Mellitus based on patient characteristics at the Wiradesa Health Center. **Methods:** Using analysis descriptive hod with secondary data on 715 samples of DM patients at Wiradesa Health Center. **Results:** The calculation results show that Type 2 DM cases are more prevalent in the 45-65 years age group with 510 patients (71.3%), females with 489 patients (68.4%), weighing around 51-70 kg with 405 patients (56.7%) with work status as housewives with 443 patients (62%). The average age was 57.92 ± 8.9 years and the average weight was 55.97 ± 9.9 kg. **Conclusion:** Based on the results of research data, type 2 DM patients mostly suffer from housewives aged 46-65. Prevention efforts include carrying out routines related to a healthy lifestyle, such as taking part in exercise or healthy walking and controlling food consumption patterns.

Keywords

Diabetes mellitus type 2, Gender, Age, Job

Introduction

Non-infectious disease is a chronic disease that cannot infect others. The Silent Killer is the name of diabetes mellitus because the disease has a huge impact on the body's organs and causes a variety of complaints in the body [1], [2]. Globally, diabetes is the seventh leading cause of death [3]. Type 2 diabetes also causes complications that can be detrimental both individually and in some sectors [4], [5]. Diabetes mellitus (DM) is a

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chronic disease that occurs in the pancreas, so it is unable to produce the insulin needed and affects insulin produced for the body ineffective [6]. Type 2 DM is generally incurable, and patients can also control their blood sugar. Insulin is a blood sugar-regulating hormone.

Hyperglycemia or elevated blood sugar levels are a common effect of uncontrolled diabetes mellitus and can cause damage to body tissues such as blood vessels and nerve damage [6], [7], [8]. Based on research, epidemiological data show that diabetes mellitus is one of the concerns in Indonesia and the world of health [1]. To this day, diabetes mellitus is still a problem of non-communicable diseases in Indonesia and even around the world [3], [9]. The causes of type 2 diabetes mellitus are divided into two: risk factors and patient factors [4], [10].

There are several factors that have been influencing the increase in diabetes mellitus, including genetic factors, obesity, unhealthy lifestyle changes such as high sugar consumption and lack of physical activity [11], [12]. In addition, there are factors that stem from the victim's relationship with the health care provider and family. The large number of people who are unable to control the patterns of consumption of foods that contain excess sugar and the non-compliance of patients with treatment is one of the causes of this case [13], [14]. Diabetes type 1, DM type 2, gestational DM and other DM types. Type 2 diabetes mellitus is a type of DM that is caused by cells in the body being less sensitive to insulin, resulting in insulin not working properly [8]. Type 2 DM is characterized by a relative insulin deviation due to pancreatic cell dysfunction and insulin resistance.

There are some symptoms of type 2 DM such as polyuria or frequent urination at night, polydipsia or excessive thirst, polyphagia or or hunger because of increased appetite but feeling less energy and weight loss. Prevention of type 2 disease can be done in many ways, including by exercising, medication, and eating patterns controlled by diet programs [15], [16]. By 2021, approximately 537 million people aged 20 to 79 are estimated to have diabetes mellitus worldwide. By 2030, it is estimated that the number of people with DM will increase to 643 million cases and by 2045, it will rise to 783 million. According to global data, China is still one of the countries with the number of patients of 140.9 million people in the age range 20-79 years [9].

While Indonesia has 19.5 million people suffering from diabetes mellitus between the ages of 20-79, this makes Indonesia one the country with the fifth highest number of DM patients by 2021 [1], [17]. On the other hand, the number of people with high blood sugar in Indonesia has increased, leading to a high death rate from DM, which is estimated to reach 6.5 million people. Signs of dangerous diabetes risk appear in approximately 45% of undetected diabetes patients, especially those with type 2 diabetes mellitus. Women became one of the categories with pre-alens cases of DM against social contexts such as employment, education, and income as an increased risk of type 2 diabetes mellitus [2], [18]. Type 2 DM occurs in women because they are more susceptible to obesity due to unhealthy lifestyle and caused by hormone estrogen.

Women who are in the menopause phase occurs due to a decrease in hormones estrogen and progesterone resulting in fat accumulation so that the transportation of glucose into cells is disrupted and decreased work of insulin due to changes in lipid profile [14].

Government programmes such as socialization for the general public and educational institutions are needed in view of the lack of information so that many people do not even know that he has diabetes mellitus. According to the IDF, the prevalence of DM in the age group of 20-79 years is higher than in other age groups [16]. With DM rising in almost every country in 2013, eradicating non-communicable diseases remains a top priority. The rate of new cases of DM is 13.4 percent and the disease can lead to more serious complications if failed and uncontrolled [1]. According to the Department of Public Health, the highest prevalence of Puskesmas Wiradesa with access to 715 patients with DM with different characteristics such as age, gender, weight and work. In type 2 diabetes mellitus there are 9 classifications according to ICD-10 (International Statistical Classification of Diseases) which are issued by WHO (World Health Organization) to classify diseases into several codes. This study aims to determine the characteristics of Type 2 Diabetes Mellitus based on patient characteristics at the Puskesmas Wiradesa.

Method

The method of research uses secondary data with a population sample of 715 patients with type 2 DM in Puskesmas Wiradesa is data of Non-Communicable Disease (NCD) diabetes mellitus that we obtained from the Department of Health District of Pekalongan. This data analysis is quantitatively descriptive. We used secondary data of gender, age, occupation and weight obtained from patient visits. The literature studying this case includes references from health journals published in the last three years (2021-2024).

This data we obtained with permission from the Puskesmas Wiradesa. The next step is to validate type 2 DM screening data provided by Puskesmas Wiradesa through patient diagnosis data in 2023, as well as targeted NCD data for 2023. We used secondary data of gender, age, occupation, and weight obtained from patient visits. We're going to use this data as a research.

Results and Discussion

Results

According to data from Puskesmas Wiradesa in Pekalongan district, there are 715 cases of type 2 diabetes mellitus patients with various types of disease codes DM type 2 from E11.0-E11.9. There are some characteristics in cases of Type 2 DM gender, age, occupation, and weight.

Table 1. Results of age frequency distribution

No.	Age Group	N	%
1	26-45	71	9.9
2	46-65	510	71.3
3	66-87	134	8.7
Total		715	100

Source: secondary puskesmas wiradesa,2023

Of the **Table 1** patients with Type 2 DM in Puskesmas Wiradesa numbered 715 people from the age range 26-45 a total of 71 people with presentations of 9.9%, age range 46-65 a number of 510 people with presentation of 71.3% and age range 66-87 a whole of 134 people with a presentation of 8.7%. The average age was 57.92 ± 8.9 years.

Table 2. Result of frequency gender type

No	Gender	N	%
1	Man	226	31.6
2	Woman	489	68.4
Total		715	100

source: secondary data puskesmas wiradesa,2023

According to the **Table 2** in Puskesmas Wiradesa there were 715 male patients with a total of 226 presentations of 31.6% and 489 female patients with 68.4%.

Table 3. Weight frequency distribution results

No	Weight (kg)	N	%
1	30-50	248	34.7
2	51-70	405	56.7
3	71-91	61	8.5
Total		715	100

Source: secondary data puskesmas wiradesa,2023

From the **Table 3** patients with type 2 DM in Puskesmas Wiradesa were 715 people. The weight range 30-50 group was 248 with a presentation of 34.7%, the weight range group 51-70 405 with a pre sentase of 56.7% and weight range 71-91 group was 61 with presentation of 8.5%. The average weight was 55.97 ± 9.9 kg.

Table 4. Result of job frequency distribution

Job	N	%
Housewife	443	62.0
Laborer/Private employed /self employed	204	28.3
PNS/Midwife/police/Soldier/ Teacher	35	4.9
Retired	16	2.2
Other	19	2.7
Total	715	100

Source: secondary data puskesmas wiradesa,2023

Of the **Table 4** Puskesmas Wiradesa has a total of 715 people with a working group of 443 people with presentations of 62,0%. Workers/Private employees/private officers 204 with a presentation of 28.3%, PNS/Bidan/Polri/TNI/teachers 35 with a presentation of 4.9%, retirees 16 with a preset of 2.2%, and others 19 with a Presentation of 2.7%.

Discussion

Based on the gender characteristic data in Pukesmas Wiradesa showed the frequency distribution results that females suffered greater with frequencies of a total of 542 and presentations of 68.3%, while male sufferers with a Frequency of a Total of 252 and Presentations of 31.75 [6]. This study is in line with the study conducted with the title Relationship of Gender Type, Age and Body Mass Index with Blood Glucose Levels during Fasting in Type 2 Diabetes Patients showed that the majority of people with Type 2 diabetes in Pukesmas Wiradesa belong to the female sex [19], [20]. Globally, several epidemiological studies report that women have a higher risk of developing type 2 diabetes than men. This situation is related to biological, hormonal, and metabolic differences between the two sexes. In women, fluctuations in estrogen and progesterone hormones during the menstrual cycle, pregnancy, and decreased estrogen levels during menopause contribute to changes in body fat distribution and insulin sensitivity. The decline in estrogen levels during menopause is known to be associated with visceral fat accumulation and insulin resistance, which are major factors in the pathogenesis of type 2 diabetes. This condition makes women, especially those of middle to old age, more susceptible to glucose metabolism disorders [6], [13], [14]. Based on the age characteristic data in Pukesmas Wiradesa showed the results of the distribution of frequency that people with type 2 diabetes belonged to the age of 46-65 years with a total of the frequencies of 589 and the presence of 17.5%. In old age hormones in the body can't produce properly [5].

In addition to these factors, there are consumption patterns that cause at that age to develop diabetes, the amount of sugar consumed into the body [3], [17]. Based on the characteristic data of work in Pukesmas Wiradesa showed frequency distribution results that type 2 diabetes sufferers belonged more to the work of the housewife with frequencies of total 496 and presentations of total 62.5%. The American Diabetes Association (ADA) says that physical activity in a working person can be beneficial in controlling blood glucose levels as well as reducing the occurrence of complications [18]. Work becomes a very influential factor in the occurrence of diabetes mellitus risk, light activity leading to a lack of energy burning in the body that will be stored in the form of body fat so that obesity occurs and becomes the risk factor of diabetes Mellitus. Women tend to have lower levels of physical activity, especially in older age groups, and are at higher risk of obesity due to changes in lifestyle and diet. The combination of hormonal factors and lifestyle can accelerate the onset of insulin resistance and pancreatic beta cell dysfunction [1]. One way to enhance that will, awareness and ability to maintain a healthy quality of life so that will be achieved the degree of optimum public health by doing health development. This data is in line with [1]. Research data that states that on the characteristics of work more as a householder suffering from type 2 diabetes [5], [21]. Based on the weight characteristic data in Pukesmas Wiradesa showed the distribution of frequency results that people with type 2 diabetes belong more at weight 51-70 kg with frequencies of 447 and presentation of a total of 56,4%. This study showed that

weight is associated with diabetes mellitus type 2, the increase in blood sugar levels can be triggered by factors of unhealthy diet and not paying attention to the amount of calories that are inducted so that the energy that is exhausted is unbalanced [8], [14], [15]. The diet affects type 2, a person with poor eating habits such as regulating 3J (number, type, schedule) will result in a person at risk of increased levels of glucose in the blood further obesity patients who rarely do physical activity [9], [11].

The aging process is also associated with changes in body composition, such as an increase in fat mass and a decrease in muscle mass, which play an important role in glucose metabolism. A decrease in muscle mass leads to a reduction in the capacity of tissues to take up glucose, thereby increasing blood glucose levels. In addition, in old age there are changes in the regulation of metabolic hormones that contribute to glucose homeostasis disorders [5], [6], [13]. The findings in this study are consistent with various previous studies that state that the prevalence of type 2 diabetes increases significantly in people over the age of 45. This reinforces the evidence that age is a non-modifiable risk factor that plays an important role in the development of type 2 diabetes [3]. Therefore, the 46–65 age group needs to be the main target in early screening, prevention, and control of type 2 diabetes at the primary health care level.

Overall, the results of this study indicate that female gender and advanced age are dominant characteristics among type 2 diabetes patients at the Puskesmas Wiradesa. These findings have important implications for the planning of diabetes prevention and management programs, particularly in the development of gender- and age-based interventions. Health education, promotion of healthy lifestyles, and more intensive metabolic monitoring of middle-aged to elderly women are expected to reduce the risk and complications of type 2 diabetes in the future.

Conclusion

Based on research data, patients with type 2 DM suffered mostly from women aged 46–65 years with a householder. This is due to the prevalence of type 2 diabetes mellitus that increases with age, especially in the 46–65 years age group due to insulin resistance factors and unhealthy diets. Therefore, the householder should increase physical activity by following routines related to healthy lifestyles such as exercise or healthy paths and controlling food consumption patterns.

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