THE RELATIONSHIP BETWEEN KNOWLEDGE AND DIET COMPLIANCE TOWARDS THE STABILITY OF BLOOD SUGAR LEVELS IN DIABETES MELLITUS PATIENTS TYPE II IN THE WORK AREA OF PAMULANG COMMUNITY HEALTH CENTER

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Abstract

Diabetes mellitus (DM) is a chronic progressive disease characterized by the body's inability to metabolize carbohydrates, fats, and proteins, leading to hyperglycemia (high blood glucose levels) (Black and Hawks 2014). World Health Organization (WHO) data states that the number of DM sufferers in the world is around 422 million people and the majority of DM sufferers are in middle and low-income countries, the number of cases and prevalence of DM will continue to increase (WHO, 2021). ***Research Objectives****: To determine the relationship between the level of knowledge and dietary compliance in type II DM sufferers at the Pamulang Health Center.* ***Research Methodology****: The type of research used is analytical observation with a cross-sectional research design where researchers want to analyze the relationship between knowledge and dietary compliance with blood sugar levels in patients with Diabetes Mellitus. The respondents of this study amounted to 84 with data collected using a knowledge questionnaire and compliance tools.* ***Research Results****: Shows that Diabetes Mellituh sufferers who have sufficient knowledge are 15 respondents (17.9%), and normal blood sugar levels are 29 respondents (34.5%), calculation analysis using chi-square tes. Diabetes Mellituh sufferers who have sufficient compliance are 13 respondents (15.5%), and normal blood sugar levels are 30 respondents (35.7%), analysis using the Chi-square test obtained a value (p-value = 0.000) so that (p-value < α = 0.05) which means Ha is accepted and Ho is rejected.* ***Conclusion****: this study found that there is a relationship between knowledge and dietary compliance to stable blood sugar levels in the Pamulang Health Center work area.* ***Suggestion****: Nursing staff are expected to be more active in providing education about the importance of dietary compliance to maintain stable blood sugar levels. This education needs to be delivered using interactive methods and a more personal approach to Type II Diabetes Mellitus sufferers.*

Keywords*: Diabetes Mellitus Type II, Blood Sugar Level Stability, Diet Compliance, Knowledge*

1. INTRODUCTION

Diabetes mellitus (DM) is a chronic, progressive disease characterized by the body's inability to metabolize carbohydrates, fats, and proteins, leading to hyperglycemia (high blood glucose levels) (Black and Hawk, 2014).

Data from the World Health Organization (WHO, 2021) states that the number of DM sufferers in the world is around 422 million people and the majority of DM sufferers are in middle and low-income countries. Based on data from the National Institutes of Health (NIH, 2023), the countries with the largest number of diabetes sufferers in 2021 are China, India, Pakistan, the United States, and Indonesia, this data is expected to remain until 2045. In Malaysia, according to data from the National Diabetes Registry (NDR), there are a total of 1,698,683 people (Ministry of Health, 2021).

According to the International Diabetes Federation (IDF), Indonesia is in fifth place with the largest number of DM sufferers with 19.5 million sufferers in 2021 and is predicted to continue to increase to 28.6 million in 2045 (KEMENKES, 2024). Based on the results of the 2023, Banten Province Health Profile report for the Banten Province area, the number of DM sufferers in 2023 was 249,564 people, with the largest number of diabetes sufferers in the Tangerang City area with a total of 93,500 DM sufferers, while for the South Tangerang City (TANGSEL) area, the number of DM sufferers was 52,488 people (Banten Health Office, 2023).

Knowledge of DM is the basis of a person's ability to control their own blood sugar, good knowledge is expected to control blood sugar levels, to improve perceptions of the disease to achieve a better quality of life. Blood sugar levels are the amount of sugar in the blood, blood sugar comes from the food we eat, and is also formed and stored in the body, blood sugar is the main source of energy for body cells, carried to each cell through the bloodstream (Marliana, 2025).

Risk factors for type II DM consist of 2 categories, namely, 1 cannot be modified such as age, gender, and age, 2 can be modified such as body weight (BB), physical activity, diet, research results conducted by Anggraeni (2024).

Blood sugar levels are the amount of sugar in the blood, blood sugar comes from the food we eat, and is also formed and stored in the body, blood sugar is the main source of energy for body cells, carried to each cell through the bloodstream, the results of research conducted by Novalia, (2020)

Dietary compliance is a person's behavior that is directed at instructions or instructions that have been given according to what has been determined, both diet, treatment, exercise or appointments, attitudes, beliefs, and personality greatly influence diet compliance (Anggraeni, 2024).

The results of a preliminary study conducted at the Pamulang Health Center on Friday, October 11, 2024, obtained data on the number of type II DM sufferers from July to September as many as 647 patients. And conducting interviews with 10 type II DM patients, it was found that eight patients knew about the diet, but the patients were not compliant in carrying out the diet, namely eating according to the daily menu provided by the family and not compliant based on the DM diet. Two patients knew about the DM diet regarding foods that could and could not be consumed, the patients said they were compliant in carrying out their diet.

2. METHODOLOGY

The type of research used is analytical observation with a cross-sectional research design. The research will be conducted in the Pamulang Health Center work area. The research will be conducted from August 2024 - February 2025. The population that will be taken from this study are type II DM patients in the Pamulang Health Center work area within a period of August – October 2024. The sampling method in

this study is by using a non-probability sampling method using analytical observation with cross sectional research design, the sampling method is carried out based on certain considerations.

3. RESULT

a. Univariate Analysis

Table 5.1 Frequency Distribution of Age in Type II DM Patients in the Pamulang Health Center Work Area. (n=84)

Age	Frequency	Percentage (%)
30-39 years	0	0,00
40-50 years	36	42,9
51-60 years	34	40,5
61-70 years	14	16,7
Total	84	100,0

(Source: Primary Data, 2025)

Based on table 5.1, it is obtained that more than half of the respondents are aged 40-50 years, totaling 36 respondents (42.9%), almost half are aged 51-60 years, totaling 34 respondents (40.5%), a small portion are aged 61-70 years, totaling 14 respondents (16.7%). and none are aged 39-39 years, totaling 0 respondents (0.00).

Table 5.2 Frequency Distribution of Gender in Type II DM Patients in the Pamulang Health Center Working Area. (n=84)

Gender	Frequency	Precentage (%)
Woman	70	83,3
Man	17	16,7
Total	84	100,0

(Source: Primary Data, 2025)

Based on table 5.2, the data shows that the majority of respondents were female, totaling 70 respondents (83.3%), and a small number were male, totaling 17 respondents (16.7%).

Table 5.3 Distribution of Occupational Frequency in Type II DM Patients in the Pamulang Health Center Work Area. (n=84)

Work	Frequency	Precentage(%)
Housewife	43	51,2
Private	31	36,9

Government employees	10	11,9
Total	84	100,0

(Source: Primary Data, 2025)

Based on table 5.3, it was found that more than half of the respondents were housewives, totaling 43 respondents (51.2%), almost half were in private jobs, totaling 31 respondents (36.9%), and a small portion were in civil servant jobs, totaling 10 respondents (11.9%).

Table 5.4 Distribution of Education Frequency in Type II DM Patients in the Pamulang Health Center Working Area.(n=84)

Education	Frequency	Prescentage (%)
elementary school	17	20,2
JUNIOR HIGH SCHOOL	31	36,9
SENIOR HIGH SCHOOL	36	42,9
Total	84	100,0

Source: Primary Data, 2025)

Based on table 5.4, it was found that more than half of the respondents had a high school education, totaling 36 respondents (42.9%), almost half had a junior high school education, totaling 31 respondents (36.9%), and a small portion had an elementary school education, totaling 17 respondents (20.2%).

Table 5.5 Frequency Distribution of Knowledge in Type II DM Patients in the Pamulang Health Center Work Area. (n=84)

Knowledge	Frequency	Precentage (%)
Good	38	45,2
Enough	46	54,8
Total	84	100,0

(Source: Primary Data, 2025))

Based on table 5.5, it was found that more than half of the respondents had sufficient knowledge, totaling 46 respondents (54.8%), almost half had good knowledge, totaling 38 respondents (45.2%).

Tabel 5.6 Frequency Distribution of Compliance in Type II DM Patients in the Pamulang Health Center Work Area. (n=84)

Kepatuhan	Frekuensi	Presentase (%)
Baik	35	41,7
Cukup	45	53,6
Buruk	4	4,8
Total	84	100,0

(Source: Primary Data, 2025)

Based on table 5.6, it was obtained that more than half of the respondents had sufficient compliance, amounting to 45 respondents (53.6%), almost half had good compliance, amounting to 35 respondents (41.7%), and fewer had poor compliance, amounting to 4 respondents (4.8%).

Tabel 5.7 Distribusi Frekuensi Gula Darah pada Penderita DM Tipe II di Wilayah Kerja Puskesmas Pamulang. (n=84)

Gula Darah	Frekuensi	Presentase (%)
Tinggi	17	20,2
Normal	62	73,8
Rendah	5	6,0
Total	84	100,0

(Source: Primary Data, 2025)

Based on table 5.7, it was found that more than half of the respondents had normal blood sugar, totaling 62 respondents (73.8%), a small portion had high blood sugar, totaling 17 respondents (20.2%), and almost none had low blood sugar, totaling 5 respondents (6.0%).

Tabel 5.8 Hubungan Pengetahuan Terhadap Kestabilan Kadar Gula Darah pada Penderita DM Tipe II di Wilayah Kerja Puskesmas Pamulang. (n=84)

Pengetahuan	Gula Darah Tinggi		Gula Darah Normal		Gula Darah Rendah		Total		P Value
	N	%	N	%	N	%	N	%	
Baik	2	2,4	33	39,3	3	3,6	38	45,2	
Cukup	15	17,9	29	34,5	2	2,4	46	54,8	0,004
Total	17	20,2	62	73,8	5	6,0	84	100	

Based on table 5.8, data obtained almost none have good knowledge with high blood sugar levels amounting to 2 respondents (2.%), almost half have normal blood sugar levels amounting to 33 respondents (39.3%), and almost none have low blood sugar levels amounting to 3 respondents (3.6%). While a small portion has sufficient knowledge with high blood sugar levels amounting to 15 respondents 9 (17.9%), almost half have normal blood sugar levels amounting to 29 respondents (34.5%), and almost none have low blood sugar levels amounting to 2 respondents (2.4%)

Tabel 5.9 Hubungan Kepatuhan Terhadap Kestabilan Kadar Gula Darah pada Penderita DM Tipe II di Wilayah Kerja Puskesmas Pamulang. (n=84)

Kepatuhan	Gula Darah Tinggi		Gula Darah Normal		Gula Darah Rendah		Total		P
	N	%	N	%	N	%	N	%	
Baik	0	0,0	32	38,1	3	3,6	35	41,7	
Cukup	13	15,5	30	35,7	2	2,4	45	53,6	0,000
Buruk	4	4,8	0	0,0	0	0,0	4	4,8	
Total	17	20,2	62	73,8	5	6,0	84	100,0	

Based on table 5.9, it was found that there was no one who had good compliance with high blood sugar levels amounting to 0 respondents (0.0), almost half of them had blood sugar levels of number 32 respondents (38.1%), and almost none had low blood sugar levels amounting to 3 respondents (3.6%). A small portion had sufficient compliance with high blood sugar levels amounting to 13 respondents (15.5%), almost half of them had normal blood sugar levels amounting to 30 respondents (35.7%), and almost none had low blood sugar levels amounting to 2 respondents (2.4%). It was found that there was almost none who had poor compliance with high blood sugar levels amounting to 4 respondents (4.8%), it was found that there were no respondents 0 (0.0%) with normal blood sugar levels, and it was found that there was no data there were 0 respondents (0.0%) with low blood sugar levels.

4. DISCUSSION

1. Univariate Analysis

Univariate analysis is an analysis used to describe descriptively the frequency distribution and proportion of each variable studied, both independent variables and dependent variables (Sumantri, 2015).

a. Age

This is also in line with research conducted by Antoro, (2023). It was found that more than half were aged 46-55 years totaling 18 respondents (51.4%), almost half were aged 56-65 years totaling 12 respondents (34.3%), and fewer were aged 36-45 years with a total of 5 respondents (14.3%). Increasing age of a person will affect knowledge and compliance which will have an impact on the stability of their blood sugar levels.

b. Gender

Based on the analysis obtained, the respondents were mostly female, totaling 70 respondents (83.3%), and a small portion were male, totaling 17 respondents (16.7%). This is in line with research conducted by Anggraeni, (2023). Respondents with type II diabetes mellitus, namely respondents more than half were female, totaling 40 respondents (54.7%), almost half were male, totaling 33 respondents (45.3%). The female gender, namely 70 respondents, was more than male.

c. Work

Based on the analysis obtained, more than half of the respondents were housewives with 43 respondents (51.2%), almost half were in private jobs with 31 respondents (36.9%), and a small portion were in civil servant jobs with 10 respondents (11.9%). This is also in line with research conducted by Khulwatunnisa, (2025). The characteristics of work were more often found in housewives with 68 respondents (57.1%), private jobs with 25 respondents (21.0%), labor jobs with 12 respondents (10.1%), civil servant jobs with 9 respondents (7.6%), and not working with 5 respondents (4.2%). Respondents with housewife jobs experience hormonal changes, especially after menopause, which can increase the risk of type II Diabetes Mellitus.

d. Education

Based on the analysis obtained, more than half of the respondents had a high school education totaling 36 respondents (42.9%), almost half had a junior high school education totaling 31 respondents (36.9%), and a small portion had an elementary school education totaling 17 respondents (20.2%). This is also in line with research conducted by Faridah, (2024). It was found that more than half of the respondents had a high school education totaling 34 respondents (43.6%), almost half had an elementary school education totaling 23 respondents (29.5%), and fewer had a junior high school education totaling 11 respondents (14.15%). The highest education is at the high school level, because it is already in an urban area where education is easily accessible.

e. Knowledge

Based on the analysis obtained, more than half of the respondents had sufficient knowledge, totaling respondents (54.8%), almost half with good knowledge amounting to 38 respondents (45.2%). This is in line with research conducted by Hirmawati, (2023). Distribution of respondents based on Knowledge of Diet Compliance, can be seen the most in the Medium Category with 21 respondents (70.0%), Low Category with 5 respondents (16.7%), High Category with 4 respondents (13.3%). More than half with sufficient knowledge, it is possible that respondents already understand the basics of Type II Diabetes mellitus.

f. Compliance

Based on the analysis obtained that more than half of the respondents with sufficient compliance amounted to 45 respondents (53.6%), almost half with good compliance amounted to 35 respondents (41.7%), and almost none with poor compliance amounted to 4 respondents (4.8%). This is also in line with research conducted by Dewi, (2019). it was found that more than half of the respondents with compliance amounted to 23 respondents (51.6%), and almost half with non-compliance amounted to 18 respondents (43.9%). More than half with compliance is in the sufficient category, perhaps respondents still occasionally feel embarrassed about their bad habits.

g. Blood Sugar Levels

Based on the analysis obtained that more than half of the respondents with normal blood sugar

amounted to 62 respondents (73.8%), a small portion with high blood sugar amounted to 17 respondents (20.2%), and almost none with low blood sugar amounted to 5 respondents (6.0%). This is in line with research conducted by Farida, (2023). With a total of 93 respondents (100%), the results obtained were more than half with normal blood sugar amounted to 56 respondents (60.2%), and abnormal blood sugar amounted to 37 respondents (39.8%). Normal blood sugar means that respondents can maintain their blood sugar stability.

2. Analisis Bivariat

Bivariate analysis is a data analysis that analyzes two variables, this type of analysis is often used to determine the relationship and influence of x and y between one variable and another, in addition to finding the influence of x and y, bivariate analysis can also be used to find differences between variables x and z (Donsu, 2019).

a. Relationship between Knowledge and Blood Sugar Levels

Based on the analysis obtained, the results of the analysis using the Chi-square test obtained a value (p-value = 0.004) so that (p-value <α = 0.05) which means that Ha is accepted and Ho is rejected. This shows that there is a relationship between.

b. Relationship between Diet Compliance and Blood Sugar Levels

Based on the analysis obtained, the results of the analysis using the Chi-square test obtained a value (p-value = 0.000) so that (p-value <α = 0.05) which means Ha is accepted and Ho is rejected. This shows that there is a Relationship between Compliance and Blood Sugar Levels in Type II DM sufferers in the Pamulang Health Center Work Area. This is in line with research conducted by Nursihhah, (2021). The results of the statistical test with the Chi-square test obtained p value of (0.000) < α (0.05), meaning there is a significant relationship between diet compliance and blood sugar level control. Having sufficient compliance will affect the stability of blood sugar levels, because respondents with sufficient compliance already understand that bad behavior will have an impact on the stability of their blood sugar levels.

5. CONCLUSION

Based on the results of the research that has been conducted on the Relationship between Knowledge and Diet Compliance with Stability of Blood Sugar Levels in Type II Diabetes Mellitus Patients in the Pamulang Health Center Work Area. The researcher's conclusions that can be drawn from this study are:Teridentifikasi karakteristik responden berdasarkan usia terbanyak berusia 40- 50 tahun yaitu sebanyak 36 responden (42,9%), berdasarkan jenis kelamin yang terbanyak adalah Perempuan dengan jumlah 70 responden (83,3%), berdasarkan pekerjaan yang terbanyak adalah IRT dengan jumlah 43 responden (51,2%), dan berdasarkan pendidikan yang terbanyak adalah SMA dengan jumlah 36 responden (42,9%).

1. It was identified that the majority of respondents had a sufficient level of knowledge, namely 46 respondents (54.8%).
2. It was identified that the majority of respondents had a sufficient level of dietary compliance, namely 45 respondents (53.6%).Teridentifikasi kestabilan kadar gula darah terbanyak pada gula darah normal dengan jumlah responden 62 (73,8%).

3. It was analyzed that there was a significant relationship between Knowledge and Blood Sugar Level Stability in Type II DM Patients in the Pamulang Health Center Work Area. The results of the analysis using the SPSS chi-square test obtained a value (p-value = 0.004) so that (p-value <α = 0.05) which means Ha is accepted and Ho is rejected. This shows that there is a Relationship between Knowledge and Blood Sugar Levels in Type II DM Patients in the Pamulang Health Center Work Area.
4. It was analyzed that there was a significant relationship between Compliance with Stable Blood Sugar Levels in Type II DM Patients in the Pamulang Health Center Work Area. The results of the analysis using the Chi-square test obtained a value (p-value = 0.000) so that (p-value <α = 0.05) which means Ha is accepted and Ho is rejected. This shows that there is a Relationship between Compliance and Blood Sugar Levels in Type II DM Patients in the Pamulang Health Center Work Area

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